MONTANA

1912

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MONTANA

Issued by the Department of Publicity of the Bureau of Agriculture, Labor and Industry of the State of Montana.

J. H. HALL, Commissioner

Edition of 1912

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FOREWORD.

In 1909 the duties of the Commissioner of the Bureau of Agriculture, Labor and Industry were increased; and he was directed to collect data upon the resources of the State, and to prepare reports therefrom "which shall be published in such form and quantity as in the judgment of the Commissioner may be deemed expedient and practicable."

The first publication of the publicity branch of the Bureau was "Montana," a booklet of 216 pages, issued in the fall of 1909. It was received with favor, and was twice reprinted. Copies have been sent from the office to every state and territory in the Union and to many foreign countries ;and, in addition to those printed at the expense of the State, one of the railroad companies bought and distributed fifteen hundred copies. The demand for "Montana" was greater than the Bureau, which has only a small appropriation for printing and other expenses, coud meet, and the work passed out of print while the demand for it continued, This book is a new "Montana" prepared on the same general plan as the other and enlarged to contain census statistics, fuller information relating to the climate and natural resources, crop statistics, many individual crop reports, and a variety of facts that illustrate the wonderful development of the agricultural resources of Montana that has taken place in the last three years. The statistics of climatic conditions and crop yields which prove the excellence of the climate and the productiveness of the soil of Montana are government statistics; and misconceptions that have existed on these points must be abandoned unless the government statistics are discredited.

The attempt has been made to put in one book a general description of the resources of Montana, which are in the infancy of their development, so that the homeseeker who reads it may gain an idea of the many advantages which the State possesses and of the many opportunities of which he may avail himself. Because the agricultural industry has been slow to develop more attention has been paid to it than to the great mining and live stock industries. No one book can cover a subject so vast; but in this volume will be found collected for convenient reference many facts that will prove of interest to residents of Montana as well as to non-residents. These facts indicate the greatness of the state in area, in achievements, and in possibilities; but show, nevertheless, that only a beginning has been made in the development of the marvelous resources of "The Treasure State." The book "Montana" has been freely drawn upon for data by writers of newspaper and magazine articles and of publicity pamphlets, and in this way its usefulness has been multiplied. The present volume will be found not less valuable for reference.

Answers to most of the thousands of inquiries that are coming to the Bureau will be found in the book; and it is hoped that many who read it will be induced to visit the State and observe the advantages to be found here. The State of Montana welcomes settlers, invites examination, points to the statistics of crop yields, to the vast area of fertile, virgin farm lands, to the fact that farming pays better than in any other state, and asserts that here are opportunities for the homeseeker and the capitalist that cannot be equalled elsewhere in North America. On another page are the names of the secretaries of Commercial clubs who will answer inquiries about their localities; and the Bureau invites correspondence upon any question relating to opportunities in Montana. The thanks of the Commissioner are extended to those who have supplied information and illustrations for the book.

J. H. HALL,
Commissioner of Agriculture, Labor, Industry and Publicity.

Helena, Montana, January 15, 1912.

Chambers of Commerce and Commercial Clubs in Montana.

County.	Secretary.	Name and Address.
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Broadwater	Julius Berg	Townsend Commercial Club, Townsend.
Carbon	G. E. Mushback	Carbon Commercial Club, Red Lodge.
	S. C. Moore	Fromberg Commercial Club, Fromberg.
		Commercial Club, Belfry.
Cascade	R. H. Bemis	Belt Commercial Club, Belt.
		Cascade Commercial Club, Cascade.
	O. M. Holmes	Board of Commerce, Great Falls.
Chouteau	W. H. Melvin	Chester Commercial Club, Chester.
	J. C. Duff	Commercial Club, Chinook.
	W. K. Harber	Commercial Club, Ft. Benton.
	J. A. Hatch	Industrial Association, Harlem.
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Fergus	G. E. Mathews	Commercial Club, Lewistown.
	L. L. Bannan	Commercial Club, Moore.
	L. S. Thurston	Commercial Club, Stanford.
Flathead	P. N. Bernard	Chamber of Commerce, Kalispell.
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	H. J. McCabe	Chamber of Commerce, Whitefish.
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	W. N. Purdy	Chamber of Commerce, Bozeman.
	F. P. Byrne	Commercial Club, Three Forks.
Granite	S. C. Rundell	Commercial Club, Philipsburg.
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	B. F. Yerkes	Madison County Publicity Club, Twin Bridges.
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	E. F. Parriot	Commercial Club, Roundup.
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	P. L. Cochran	Commercial Club, Stevensville.
	Al. Rissmann	Commercial Club, Darby.
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	Hart Willis	Commercial Club, Plains.
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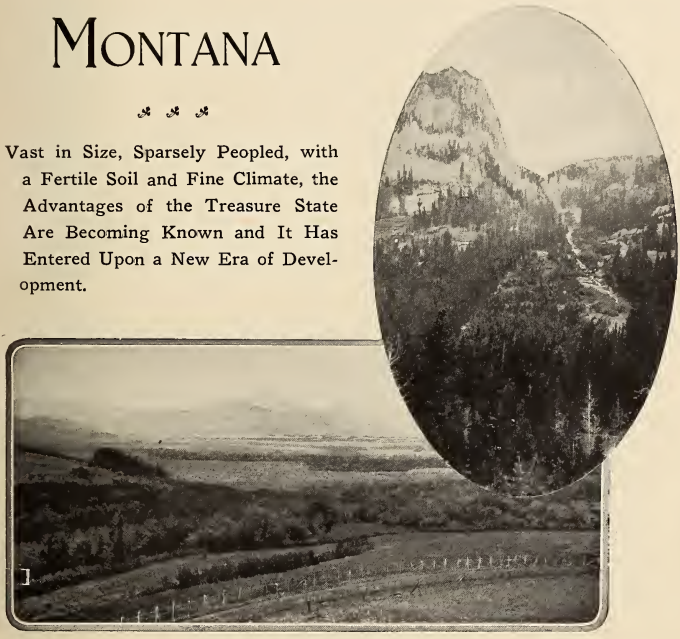
	Chas. Austin, ass't	
Sweet Grass	A. D. Nichols	Commercial Club, Big Timber.
Teton	J. E. Webb	Commercial Club, Choteau.
	J. M. Kelly	Conrad Development Club, Conrad.
	Shelby Washburn	Shelby Commercial Club, Shelby.
Valley	G. H. Coulter	Commercial Club, Culbertson.
	John E. Dawson	Commercial Club, Glasgow.
		Froid Commercial Club, Froid.
	W. B. Wooldridge	Commercial Club, Hinsdale.
	E. Sklower	Commercial Club, Malta.
	Thomas R. Forbes	Commercial Club, Mondak.
	H. E. Rickard	Commercial Club, Poplar.
Yellowstone	Grant Monroe	Chamber of Commerce, Billings.
	W. L. Mitchell	Hardin Commercial. Hardin.
	S. E. Dove	Commercial Club, Huntley.
	Guy Boyington	Laurel Commercial Club, Laurel.
		Park City Commercial Club, Park City.
		Commercial Club, Columbus.

MONTANA

Vast in Size, Sparsely Peopled, with a Fertile Soil and Fine Climate, the Advantages of the Treasure State Are Becoming Known and It Has Entered Upon a New Era of Development.



"I sold my land in Iowa for twice what I paid for land in Montana, and the Montana land yields twice what the Iowa land yielded," a man who had bought a farm in one of the fertile valleys of Montana said to a writer a few years ago. Many like opportunities exist for those who are able to buy improved farms.

Another who first rented a farm, then took up a homestead, and now dwells in comfort and independence on his own valuable farm writes: "I came to Montana for the reason that I believed it presented better opportunities for the young man than the East."

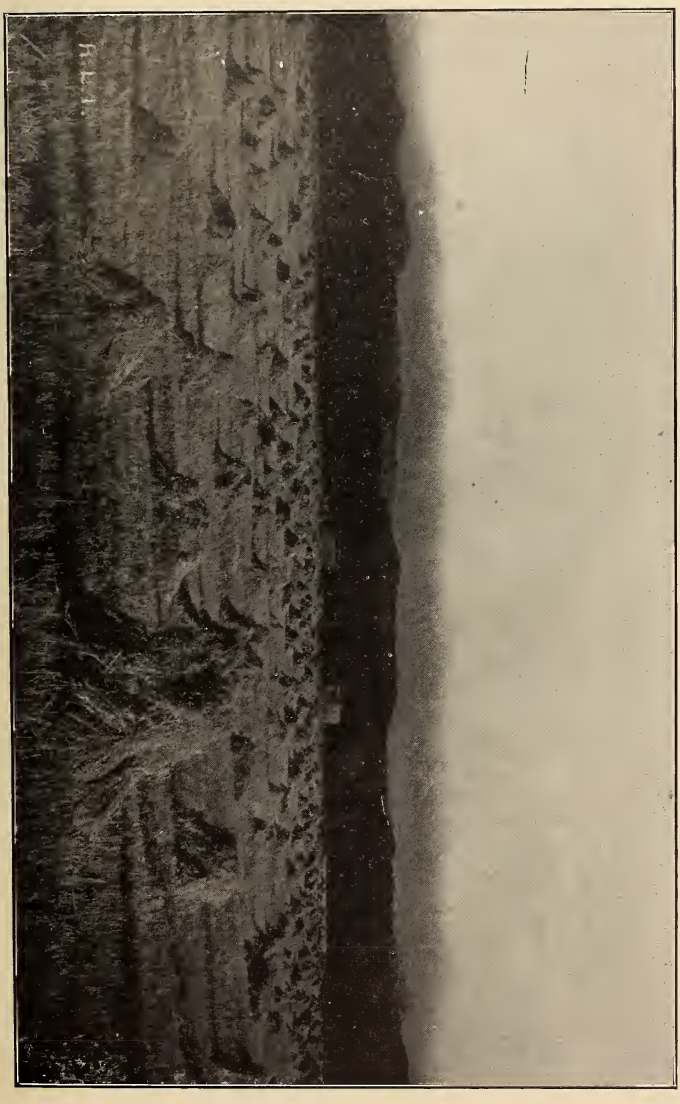
A third gives a reason that will appear good to parents of young children. "I thought by coming out to the West I could do better, and that there would be better chances for the boys, and in this I was not mistaken," he says.

There are many reasons which induce men to change their places of residence. Some move to get away from drouth or floods or cyclones; from the washing away of the soil of their farms; from the drain on their resources caused by the necessity of purchasing fertilizers. Men work-

ing as tenant farmers or for salaries or wages are eager to become independent land owners. Rather than divide the home farm into small parcels for their children prudent parents aid their sons and send them forth to seek farms of their own. Many feel that they could better their condition in a less crowded environment. Some who are succeeding in a small way feel that they can succeed in a large way in a country just beginning to be developed, and those who have capital know that their money can be put to work more profitably in a new country than in an old one.

The movement of population to new lands to the westward has never ceased since early colonial times. From the Atlantic seaboard to the first range of mountains; across it; over the Allegahnies; across the Ohio, the Mississippi, the Missouri; through vast prairies to the Rocky Mountains; over the Continental Divide; down the long trail to the Pacific Ocean; the wave of settlement pushed on to the western sea, an unceasing movement and a resistless force that conquering formidable natural obstacles and overwhelming hostile natives swept aside every barrier to its progress.

The pioneers who blazed the trails were followed by settlers who reduced the land to cultivation. Agricultural development quickly followed the opening of public lands to peaceful settlement in most of the western states, but Montana developed in a different manner. Gold seekers were the founders of Montana; they discovered rich deposits of placer gold and later ores of gold, silver, lead, and copper, and mining became the chief occupation of the people. Horses and cattle and sheep were brought in and the range live stock industry started. Mining and live stock engaged the attention and rewarded the industry of the early settlers. Farming was carried on with conspicuous success in a few localities; but its spread throughout the state and its rise to an importance equal at present almost to mining, with only a small part of the farming area in cultivation, is the work of the last few years. The country did not settle with farmers as rapidly as did Kansas, Nebraska, the Dakotas and Oklahoma notwithstanding the fact that millions of acres of rich, open prairie land lay waiting for the plow. Montana was kept back by failure to give publicity to its resources and by the lack of railroad facilities; and its advantages as a farming region were obscured by the reputation it had gained as the premier mining state and the premier live stock state of the Union. As population increased and landseekers were forced westward, as railroads were extended and the fertility of Montana's soil became known, a new era of development began. It is fortunate for the present generation of homeseekers that the fertile farm lands of Montana were left in a pastoral condition to provide homes for them for nowhere else in the United States can they find so many acres of good land that have never been tilled. When the lands now vacant in Montana shall have been settled upon the era of cheap lands in the United States will have passed forever. Of the gold seekers of early days the few succeeded and the many failed,—of the homeseekers of today few will fail if their labor is well directed; and to transform a tract of



Irrigated Oats in the Gallatin Valley.

raw land on bench or prairie into a farm and home while less spectacular is an achievement surely not less worthy of praise than to find particles of gold in the bed of a stream or on the side of a gulch.

Some of the reasons why the larger part of Montana's fertile lands have remained untilled and unoccupied have been indicated; but of more present interest to the landseeker who is anxious to learn where he may now acquire a tract of good farming land on which to make his home and earn a living is the information that Montana is the place for him; here he may find what he has been seeking, end his search, and commence to lay the foundation for a career of independence and comfort, perhaps of wealth. This book is intended to be of interest and value to him because it tells of the millions of acres of fertile farming lands in Montana that are subject to homestead entry and of the hundreds of thousands of acres of raw lands that may be bought at the price of grazing lands. Such lands are to be found in most of the counties at varying distances from the railroads and when cultivated will yield crops similar to those produced on the lands now in cultivation. Some may prefer to become the owner of an irrigated farm within one of the Carey Act or Government Reclamation projects; others may wish to buy an improved farm, a fruit tract, or an orchard and will find them on sale at lower prices than are asked for less productive lands in other states. In this big state is a wide choice and nowhere have lands reached their real value reckoned on an investment basis.

Every day knowledge of the opportunities which exist in Montana is spreading and every day new settlers are coming into the state. The public lands are being rapidly taken. Every business day is land day in Montana; the land seeker does not have to wait for a proclamation announceing that at a time named registrations will be made of the names of those who desire to enter land within a tract which is to be opened for settlement, that a drawing will be had and that the winners will be permitted to make homestead entries and to acquire title to a quarter section on compliance with the homestead law and on payment of the price per acre named in the letter of instructions to the local land officers; in Montana there are ten public land openings every day, beginning every morning when the doors of the local land offices at Billings, Bozeman, Glasgow, Great Falls, Havre, Helena, Kalispell, Lewistown, Miles City and Missoula, are opened for the transaction of business.

Montana desires homeseekers to come and till its uncultivated lands, to aid in developing its varied natural resources, to add to the number and strength of its citizens; and it offers greater opportunities to the energetic and returns greater rewards for intelligent efforts than any other state. For those enterprising enough to grasp them the Treasure State is crowded with opportunities.

In the pages that follow a variety of information is set forth that will aid those who are considering a change of location to form some idea of what kind of a country Montana really is. So vast is the state and so varied are its resources that no wholly satisfactory account of them can

be given in one book. The way to learn what Montana has to offer is to visit it; and he who comes will behold a panorama of activity and prosperity and beauty that no words can picture. The visitor will breathe the exhilarating air, drink the pure water, gaze on mountains and valleys and plains of great scenic beauty; he will witness mines yielding up great

Where the River Cleaves the Mountain.

quantities of rich ores and huge smelters recovering the valuable contents; he will view fat herds and flocks on a thousand hills, see fields of grain such as he never saw before, meet a rich, contented, and hospitable people, and behold vast tracts of virgin land waiting for the plow. In a country having all the natural resources needed to support a great population he will learn that the inhabitants number less than three to the square mile, and from his own observations will draw the only possible conclusion namely, that Montana is the land of unequalled opportunities.

PHYSICAL FEATURES.

Topography—Mountains—Rivers and Valleys.

Montana is big—that is the thought one should bear in mind at all times. It is of greater area than all the New England States, New York, New Jersey, Delaware and Maryland put together; among the states only Texas and California exceed it in size; and in Montana are counties larger than some populous states. England, Wales, Scotland and Ireland combined have fewer square miles of territory; France and Germany are countries which are not greatly larger. Montana has land in abundance but it lacks people; the great state of Montana, in extent an empire, has now scarcely 400,000 inhabitants within its vast domain.

Topography.

Montana, known also as "The Treasure State," is one of the northwestern states of the United States; it is bounded on the east by North Dakota and South Dakota, on the west by Idaho, on the south by Wyoming and Idaho and on the north by Canada.

The main range of the Rocky Mountains crosses the state in the western part. The first settlements were made in this section and for this reason Montana—a Spanish word meaning a mountainous region—was chosen as the name for the territory when it was created in 1864. The name is melodious, and is appropriate to a part of Montana, though misleading when used as a descriptive term for the whole territory embraced within the boundaries of the commonwealth.

Two thirds of Montana consists of level undulating or table lands, and even in the mountainous parts are many valleys some of which are of large extent. From the eastern boundary to the backbone of the continent the land rises gradually forming a great plain of rolling country which is large enough to contain several of the older states. This great region which has been devoted almost entirely to the pasturage of cattle and sheep is undergoing a marvelous transformation in being converted into a farming region.

The part of Montana that lies on the western side of the Rocky Mountains comprises about one third of the area of the state. It is a region of many mountain ranges and of numerous streams. Large or small valleys are of frequent occurrence; and some are very extensive, the most noteworthy being the Bitter Root, the Clarks Fork and the Flathead Valleys. Foot hills and mountains are usually heavily timbered, but there are many grass-covered slopes that rise from the valleys to high elevations. Flathead Lake, one of the most beautiful bodies of water in the world, and many smaller lakes are in this section.

Mountains.

The main Rocky Mountain range, the chief feature of the physical geography of Montana divides the state into two sections of unequal size, Eastern Montana and Western Montana. The main range is extensive and

there are many spurs and inferior ranges; high peaks are not absent, but the mountains of Montana do not attain as high elevations as those of Colorado, and frequent passes afford comparatively easy routes for the railroad builder. The Northern Pacific Railroad crosses the Continetal Divide at Mullan Pass at an elevation of 5,547 feet; Summit, the highest point on the Great Northern Railway is 5,202 feet above sea level; and the elevation of Donald, the station of highest elevation in the Rocky Mountains on the line of the Chicago, Milwaukee and Puget Sound Railway, is only 6,332 feet.

Rainbow Falls of the Missouri River.

Before reaching the point of crossing the Great Northern Railroad runs 475 miles through the northern part of the state east of the main range, in that distance climbing from 1,922 to 5,202 feet; from the eastern boundary of Montana to the Mullan Pass by the line of the Northern Pacific Railroad is 516 miles; and Chicago, Milwaukee and Puget Sound trains travel 504 miles in Montana before reaching the tunnel through which they pass from the Atlantic slope to the Pacific slope of the continent. The passes are all lower than those in states south of Montana; and as a consequence, the Montana railroads attain no heart breaking altitudes. At both the eastern and western boundaries the elevation of railroad tracks is less than 2,000 feet. In Western Montana the Northern Pacific Railway parallels for many miles the Coeur d' Alene Mountains, follows

Clarks Fork River and leaves the state at an elevation of about 2,200 feet; the Chicago, Milwaukee and Puget Sound Railway climbs the range and crosses it with only a slight deviation from its westward course; and the Great Northern Railway, which runs along the banks of the Kootenai River, passes out of the state at an altitude only slightly greater than 1,800 feet.

The low elevations at which the railroad lines pass the Continental Divide, the hundreds of miles each traverses on easy grades before entering the main range, and the altitudes at the eastern and western boundaries, are facts which make evident the fortunate position that Montana occupies among the Rocky Mountain states.

The report of Professor Gannett of the United States Geological Survey states that the average elevation of Montana above sea level is 3,900 feet. The average elevations of other states in this section are given as follows; Nevada, 5,600 feet; Wyoming, 6,400 feet; Colorado, 7,000 feet. Below an elevation of 4,000 feet Utah has no square miles, Colorado has only 9,000, while Montana has 51,600. Below 3,000 feet in altitude are 40,700 square miles within Montana. "Taking the area of the state (Montana) as a whole," says U. S. Census Bulletin 153, "it has been ascertained that 49 per cent is under 5,000 feet above sea level; 21 per cent from 5,000 to 6,000 feet; 14 per cent from 6,000 to 7,000 feet; 9 per cent from 7,000 to 8,000 feet and 7 per cent over 8,000 feet." The elevation at Helena, the capital of Montana, which is located at the base of the Continental Divide, is 4,110 feet. Salt Lake City has an elevation of 4,350 feet, Denver of 5,300 feet and Santa Fe of 6,840 feet.

The influence of high altitudes upon climate and consequently upon crop productions is too well known to need comment; but the fact that Montana has within its borders such a vast area of land lying at a low altitude is an assurance of its future greatness as a farming region, and will be surprising information to such as have imagined that the state was composed of masses of mountains. Numerous low mountain passes also exist through which the warm winds from the Pacific Ocean find their way and temper the climate.

Rivers and Valleys.

Montana is rich in rivers and in large and fertile valleys. The advantages of its admirable river systems it would be difficult to overestimate. The rivers rise in the highest mountains some peaks of which reach the height of 11,000 feet, and flow to the borders of the state where the elevation does not exceed 2,000 feet. Near their sources are great mining camps, and no part of the mountain region is without wood, water and grass which are necessities in the camps of the prospector, the miner, and the pleasure seeker.

The Missouri and the Yellowstone are the great rivers which drain the eastern part of the state, which comprises two-thirds of its territory. From the sea to its source the Missouri is said to be the longest river in the world. It is formed at Three Forks, Gallatin county, by the union of the Jefferson, the Madison and the Gallatin rivers and flows at first

north, then east through the central northern part of Montana into North Dakota where a few miles beyond the state boundary line it receives the waters of the mighty Yellowstone river. Many large rivers flow into the Missouri and each has numerous tributaries. In order from east to west the chief affluents of the Missouri from the north are the Poplar, the Milk, the Marias, the Teton, the Sun and the Dearborn rivers; the Musselshell, the Judith, the Belt and Smith rivers enter from the south. These rivers drain extensive areas each of which differs in some respect from the other.

The three rivers which form the Missouri are large streams. The Gallatin river rises in the Yellowstone National Park and flows north through the Gallatin Valley a section of marvelous fertility. The Madison river also rises in the Yellowstone Park and flows north through the upper and lower Madison valleys. The largest of the three is the Jefferson river which is formed by the junction of the Big Hole and Beaverhead rivers. It receives from the north the Boulder river which drains the greater part of Jefferson county. The Big Hole Basin, the Beaverhead Valley, the Ruby Valley and the Jefferson Valley are notable parts of this drainage basin. Milk river has a long and extensive valley and drains the region south of the Canadian boundary line. The Musselshell flows for many miles through the central part of the state, and the large and fertile Judith Basin is drained by the Judith river which flows through it.

The Yellowstone river carries a great volume of water and is a swift and beautiful stream. Important tributaries which enter from the south are the Powder, the Tongue, the Big Horn, Clark's Fork of the the Yellowstone, the Stillwater and the Boulder rivers. The first four named rivers rise in Wyoming. The principal streams which empty into the Yellowstone from the north are the Sweet Grass and Shields rivers. The Yellowstone Valley widens out at many points and there are more or less extensive valleys along all the tributary streams.

The waters which fall in western Montana find their way to the Pacific Ocean through the Columbia river into which empty Clarks Fork of the Columbia and the Kootenai which are the two great rivers of this section. This portion of Montana abounds in streams, the Deer Lodge, the Big Blackfoot, the Bitter Root, the Missoula, the Flathead are the chief rivers which gather the waters of two thirds of Western Montana and pour them into Clark's Fork of the Columbia. Although a large river the Kootenai drains but a small portion of Montana.

In a peak in Glacier Park rise three small streams whose sources are close together; the waters of one stream find their way to the Pacific Ocean; those of another to the Gulf of Mexico; while those of the third make the long journey to Hudson Bay.

Montana has many beautiful lakes. Flathead Lake is the only one of a large size; it is 33 miles long and 15 miles wide, covers an area of 360 square miles, and is navigated by steamships which make regular trips between the principal ports.

CLIMATE.

What sort of climate has Montana? is a question often asked. One part of the state is on the Atlantic and the other on the Pacific slope of the continent; it embraces an area as great as two thirds of France or Germany; elevations range from 2,000 to 6,000 feet, rising even to 11,000 feet in the uninhabited mountain ranges; there are regions of plains, and of foot hills; there are sheltered basins and valleys; and for these reasons climatic conditions at one point differ from those at another not similarly situated. On another page may be found a table of statistics relating to weather conditions at many representative stations. Every county is represented in these reports and a study of them will remove any false notions that may have been entertained on this subject.

The climate of Montana is excellent; it is healthful and exhilarating; the water is pure; and the air—clear, dry, vitalizing, filled with ozone—is of a kind which it is a luxury to breathe. Perhaps nine out of every ten persons who ever lived one whole year in Montana prefer its climate the year around to the climate of any other region of which they have personal knowledge. The country is healthful and the death rate is the lowest of all states except one.

The following comprehensive statement of the weather conditions in Montana is taken from an official publication:

"There are no fogs, no malaria in Montana, and contagious and infectious diseases are rare, and when manifested prove to have come from the infection of less favored states, but here they yield readily to professional treatment, proving fatal in only the exceptional case. The winter season is not one of continued cold; when the frigid breezes of Canada are directed over the state the thermometer will drop as low as twenty degrees below zero, but these cold periods are infrequent and of short duration, as the prevailing winds of the winter are the soft chinooks that quickly dissipate the snow and bring the balmy atmosphere of summer and the tinge of a pleasing autumn. And when a cold wave does sweep in from the east or north, it is not severely felt as the atmosphere at such times is almost entirely free from the chill of moisture, and one does not feel twenty degrees below here as severely as zero and above is felt in the eastern states. Except upon the plains of the extreme eastern border of the state, the blizzard is unknown, and the cyclone and the tornado are not known. Great herds of cattle and flocks of sheep feed throughout the winter on every bench and plain, and these are given but little shelter, food or attention. The nourishing properties that remain in the grass and sustain the stock during the winter months is due to the fact that before the grass is ripened, the chinook winds cure it, turning it into standing hay, instead of having the frost drive the nutriment into the roots, leaving dead and substanceless straw. This, with the salubrity of the climate, is

the secret of the success of Montana's stock ranges. The snowfall is light except in the midst of the mountain ranges and at the higher altitudes, the greater part of the state seldom receiving a precipitation of more than two or three inches at a time. The winters are capricious, but they are warm, sunlit and inviting, and the occasional cold snap but adds vigor to the universal energy of the people. Spring, summer, autumn and winter are all enjoyable and healthful seasons. In midsummer when the sun is overhead, the temperature reaches an uncomfortable point, but as the sun dips behind the mountains the cooling air of the Rockies displaces the heated air of the day, leaving the evenings and nights delightfully cool and refreshing,"—[Seventh Annual Report, Bureau of Agriculture, Labor and Industry, pages 9-10.]

A Government report on the climate of Montana contains the following:

"The light snowfall in the valleys throughout the state during the winter months is usually speedily evaporated by the chinook winds which are prevalent from Oregon to Nebraska, from the Peace River to Arizona, being particularly common in Montana, where they do much to modify the climate."

The chinook is a wind which comes from the warm Japanese current in the Pacific Ocean and tempers the climate in all the country it reaches. There are cold days in Montana as are to be expected in a northern state, but a cold "spell o' weather" usually lasts only two or three days at a time, and outdoor work during the winter months is seldom prevented by the severity of the cold.

Sample of the State's Scenic Beauties.

In his little book called "The Treasure State," James H. Mills, said:

"The average temperature in Montana is about the same as in New York or Pennsylvania. The snowfall in the valleys is less than in either of those states; there is more sunshine than in any Middle, Eastern or New England state, and the great mountains, ribbed with veins of gold, silver and copper and crowned with majestic forests, are but gigantic framework in which are set great picture valleys, bench lands and foothills, fertile as the Valley of the Nile, and which have never yet refused to yield bounteous harvests when touched by the hand of industry and nourished with water."

Randall J. Condon, superintendent of the public schools of Providence, Rhode Island, for some years resided in Montana and has written for a geography which is used in the public schools a brief but comprehensive

account of Montana. From personal knowledge he writes the following words about the climate of the state.

"It is doubtful if there is another state in the Union where the climate taken the year round is so delightful as that of Montana. Its northern latitude is more than offset by the mild westerly winds, which temper the climate of the mountains and plains and yet do not bring excessive moisture.

Fogs are almost unknown, and on the days when the temperature is low there is not that penetrating chill which is felt in the more humid states.

As in any extreme northern state, the thermometer occasionally records a low midwinter temperature of 20°, 30°, and, in rare cases, 50° below zero; but the "cold spells" are short. While they remain there is practically no wind; the air is dry and the sunshine clear. The ordinary outdoor occupations may be carried on in winter with little inconvenience. On the other hand, the summer temperatures are never oppressive, and heat prostrations are unknown. The temperature in the middle of the long summer days may rise higher than in states farther south, but with the coming of night the cool mountain breeze brings a delightful change.

A COMPARISON OF THE MONTHLY AND MEAN ANNUAL. TEMPERATURES FOR FOUR STATES.

State.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	An-nual.
Montana	19	22	30	44	53	59	66	65	55	45	31	24	44
Wisconsin	15	16	29	42	56	65	70	67	59	48	32	19	44
New York	22	22	31	44	55	65	69	67	61	49	37	27	46
Ohio	28	27	38	50	61	70	74	71	65	53	41	31	49

In a state of such diverse topography as Montana no one statement can be made which will apply alike to all sections.

The western or mountain section—especially in the valleys—has a milder climate, receives more moisture, and is less subject to sudden changes than the eastern or plains section.

The following tabulation taken from the records of many stations for a series of years shows the average number of days of sunshine, cloud and rain:

	Average Number of Days.			
	Clear	Partly Cloudy	Cloudy	With Rain
East Division	175	125	65	80
West Division	129	136	100	98

A temperature of 90° or above may occur on a few days of summer in the western valleys, while in the eastern sections 100° or above may be recorded. By referring to the temperature charts it will be seen that the extremes of summer heat are recorded in the southeast; the winter extremes in the northeast. The mean annual temperature ranges from 37° in the extreme northeast to 47° in some of the sheltered valleys. In the warmest sections—the upper Yellowstone valley, the basin west of the main divide and in several of the smaller valleys in the central portion just east of the mountains—the winters are less severe than those in the Mississippi valley and the east, five or ten degrees farther south."

A tribute to the fine climate of Montana was recently published in Colliers, the great New York weekly, in the following words:

"Because we owe something to those who are seeking better opportunities we have been writing lately of the new west. Misinformation, more often than lack of grit or pluck, has kept many from venturing on the chances of a new life there. Take Montana as an example. Twenty years ago our geographies and our newspapers pictured it as a forbidding region. The country has not changed except in the tilling of its soil and in the development of its mines. Yet we know that our information as to its climate was erroneous. Nowhere is life better, pleasanter or more healthful. You can take a daylight walk across the country for miles in February or March in southwestern Montana without an overcoat, and you will not

A Montana Landscape.

be likely, if you are a stranger, to forget the glory of sun and air. Forty below zero, that you occasionally read of in the newspaper dispatches from a government post on the northern frontier, is not more uncomfortable than zero in New York and rarely lasts longer than forty-eight hours. The summers are ideal. The cool nights always bring renewed life. Many a weary statesman and traveler has lingered for a summer day in Helena, that city set on hills; and regretted that his lot was not oftener cast in such pleasant places. In Helena you will meet more people familiar with Pope and Dryden than you will in New York or Boston, population considered, and you will find them more democratic. It is not surprising that the recent development of Montana has been marvelous. For years the railroads, in their invitations to settlers, failed to do the state justice. To irrigation and to the praises of those who have lived there and prospered of its bounty its present advance is largely due. In some agricultural lines its soil is the richest in productiveness of any in the Union."

County.	Station.	Temperature (degrees Fahrenheit).								Precipitation (inches)—(3).							Sky.				Prevailing direction wind blew from.
		Elevation, feet.	Length of record years.	Annual average.	Highest.	Date.		Lowest.	Date.	Length of record years.	Annual Average.	Greatest monthly.	Month.	Least monthly.	Month.	Total snow fall.	No. of rainy days.	No. clear days.	No. partly cloudy days.	No. cloudy days.	
Beaverhead	Dillon	5,147	13	45.8	94	July	15	—22	Feb. 22	13	17.39	3.21	Sept.	0.11	Aug.	48.1	92	161	122	82	S. W.
Broadwater	Canyon Ferry (1)	3,644	12	45.0	98	July	14	—34	Feb. 22	12	12.33	2.95	June	0.05	Mar.	24.5	60	187	113	65	N.W.
Carbon	Bridger	3,664	2	47.1	102	July	14	—25	Feb. 22	2	9.13	2.23	May	0.05	Feb.	13.0	37	109	153	91	S.
Cascade	Great Falls	3,350	19	48.4	98	July	14	—34	Feb. 22	19	14.83	3.35	Sept.	0.20	Dec.	27.9	73	162	159	44	S. W.
Chouteau	Havre	2,505	31	44.9	102	July	17	—33	Feb. 22	31	13.45	1.40	May	0.08	Oct.	29.4	77	147	127	91	S. W.
Custer	Miles City	2,371	19	48.4	108	June	19	—29	Feb. 22	33	13.22	2.81	June	0.41	Dec.	35.2	76	...	...	...	N. E.
Dawson	Glendive	2,069	21	....	111	July	14	—34	Feb. 17	19	15.48	....	.....	....	....	.....	...	...	...	...	.....
Deer Lodge	Anaconda	5,300	9	43.3	93	July	14	—29	Feb. 22	4	15.45	2.22	Nov.	0.25	Dec.	44.4	...	...	...	...	.....
Fergus	Lewistown	4,010	13	44.6	98	July	17	—36	Feb. 22	9	19.51	3.03	Sept.	0.25	Mar.	....	69	163	146	52	W.
Flathead	Kalispell	2,965	12	44.4	95	July	17	—22	Feb. 22	14	15.61	2.31	Sept.	0.40	June	44.5	111	110	121	134	W.
Gallatin	Bozeman (2)	4,700	13	42.7	93	June	27	—29	Feb. 22	13	18.61	3.51	Sept.	0.41	Dec.	....	74	...	...	...	S. W.
Granite	Philipsburg	5,275	7	43.6	98	July	13	—29	Feb. 22	7	15.36	2.14	Sept.	0.26	Dec.	57.4	69	183	81	78	W.
Jefferson	Boulder	4,920	15	....	...	....	..	—38	Feb. 22	10	10.00	....	.....	....	....	.....	...	...	...	...	.....
Lewis and Clark	Helena	4,110	31	45.0	96	June	26	—29	Feb. 22	29	13.26	1.77	Sept.	0.04	Mar.	55.6	81	132	127	106	W.
Lincoln	Troy	1,880	16	....	100	July	16	—26	Feb 26	15	24.22	....	.....	....	....	.....	...	...	...	...	W.
Madison	Virginia City	5,880	22	43.1	91	July	14	—19	Feb. 22	18	14.95	3.56	May	0.10	Feb.	....	77	167	125	73	W.
Meagher	Harlowton	4,165	2	43.0	95	July	17	—38	Feb. 22	12	15.50	....	.....	....	....	.....	...	...	...	...	.....
Missoula	Missoula	3,225	30	46.4	102	July	14	—15	Jan. 3	27	15.83	2.76	Sept.	0.13	July	....	96	...	...	...	S. W.
Musselshell	Ryegate	3,640	1	....	104	June	27	—40	Feb. 22	1	12.27	4.76	Sept.	0.12	Dec.	....	47	242	49	64	.....
Park	Livingston	4,488	14	48.1	100	July	14	—27	Feb. 22	10	14.52	....	.....	....	....	.....	...	...	...	...	.....
Powell	Ovando	4,207	11	....	94	July	14	—38	Feb. 22	9	18.36	....	.....	....	....	.....	...	...	...	...	.....
Ravalli	Hamilton	3,575	8	47.5	97	June	26	—26	Feb. 22	8	12.16	3.35	Sept.	0.20	Apr.	....	71	180	139	46	.....
Rosebud	Forsyth	2,514	5	48.5	108	July	14	—38	Feb. 22	3	13.68	2.80	May	0.20	Dec.	17.3	42	179	79	94	E.
Sanders	Plains	2,475	12	45.8	95	July	14	—21	Feb. 22	12	12.76	2.00	Feb.	T.	June	....	34	193	6	166	S. W.
Silver Bow	Butte	5,716	17	44.6	92	June	26	—24	Feb. 22	14	13.05	2.20	Sept.	0.20	Apr.	....	55	157	71	130	N.W.
Sweet Grass	Busteed	.....	3	46.5	101	July	17	—36	Feb. 22	3	13.46	3.56	Sept.	0.06	Mar.	56.0	89	167	126	72	W.
Teton	Cutbank	3,700	12	43.9	95	July	17	—45	Feb. 22	10	18.86	1.73	June	T.	Oct.	....	25	239	171	55	W.
Valley	Poplar	2,020	26	43.2	108	June	20	—44	Feb. 18	21	13.60	1.95	Mar.	T.	Oct.	19.7	25	280	36	46	W.
Yellowstone	Billings	3,115	15	47.5	106	July	13	—32	Feb. 22	4	14.15	1.85	Sept.	0.05	Mar.	....	46	...	...	...	W.

(1)—In Lewis and Clark County near the Broadwater line. (2)—Obs ervations taken at the Agricultural College. (T)—Indicates trace of

The Way Raw Land is Broken

PRODUCTS OF THE LAND.

Fertility of soil shown by Crop Statistics and Quality of products by Prizes won in competition.

Inhabiting this empire of Montana, whose mountains, rivers and climate have been briefly described, the enumerators of the United States Census Office found in 1910 only 376,053 persons. The area of the state is 146,000 square miles and the population per square mile was only 2.6. Montana has, therefore, room for millions of people; and it has the natural resources to provide ample support for them.

The country is even more sparsely settled than the figures would indicate for the reason that 133,420 of the total population lived in cities and towns and 242,633 in country districts. The farms numbered 26,214 and included 3,640,309 improved acres, an increase of 109.6 per cent over 1899. It has been estimated that there are 30,000,000 acres of arable land in the state of which it appears that 26,359,691 acres were outside the farms enumerated.

These untilled acres except in rare instances are lands which have never been plowed. Many of them have been filed on as homesteads but have not yet been cultivated; others are within the limits of stock ranches; of the millions of acres of public land which the Northern Pacific received to aid in its construction and to promote the rapid settlement of the country, the company still owns a considerable part; the state of Montana has disposed of but a small portion of the land that was granted to it for educational purposes; but the greater part of the uncultivated tillable land is unreserved public land which is subject to entry under the homestead law. When this acreage shall be producing crops Montana will rank among the first of the agricultural states and the value of the land will then be determined here, as it now is in other states, by the income which it yields.

Millions of acres of these raw lands will yield under proper cultivation and without irrigation what the State Experimental Farms have demonstrated such lands are capable of yielding viz: Crops of 37.71 bushels of Turkey Red fall wheat to the acre; 32.4 bushels of Lofthouse fall wheat; 37.28 bushels of Gold Coin fall wheat; 38.27 bushels of fall rye; 38.27 bushels of California barley; 31.64 bushels of oats, and 123.87 bushels of potatoes.

That Montana deserves the name of "The Treasure State" not less for potential greatness in agricultural production than for present greatness in the mining industry the experience of the last five years has demonstrated. The soil both in the valleys and on the benches is very fertile; and the area of land in cultivation grows greater every year. Large irrigation projects which are now under construction will, when completed,

practically double the acres of irrigated land; but the development which has been most significant of the future growth of the state has been the extension of farming to non-irrigated benches and uplands and the success of such efforts wherever approved methods of cultivation have been followed.

The farm products which are shown at county fairs, and on larger scale at the Montana State Fair, every year cannot be excelled in any state. President Taft visited the State Fair of 1909 and left the grounds with a new idea of Montana. On that occasion the empire builder James J. Hill said:

"Montana has within her borders unoccupied agricultural lands equal—practically equal, or nearly so—to the entire state of Iowa, or the state of Illinois, and certainly they may be considered the richest states in the Union, but neither the state of Illinois nor the state of Iowa can make as good an exhibit on all counts as you have shown today in the exposition building over there."

These are very strong words to be expressed by such a man, one who is acquainted with the resources of every part of the United States and who weighs his words before speaking them, but they are not stronger than the facts warrant, and are echoed in substance by every visitor who informs himself on the subject.

Cutting Grain.

Senator LaFollette of Wisconsin, who has paid several visits to Montana, said during the Apple Show at Missoula:

"What you have here bears testimony that Montana is not simply a mining and stock raising state, but rather one of wonderful riches and diversity of soil and wealth. God has been good to this portion of the earth. He has given you mountains with their forests, mineral wealth and vast plains of rich soil and mighty rivers for power of inestimable value. The conditions must make it if not the empire state of our union at least one in the front rank of our galaxy of states."

No state officer collects statistics of the acreage and production of crops. According to the last Year Book of the United States Department of Agriculture, which contains statistics of the highest authority, crops of hay, wheat, oats, flax, barley, potatoes and corn were harvested in Montana in 1910 from 1,579,000 acres. The acres planted in sugar beets is not stated; probably it was 15,000; for miscellaneous crops and vegetable gardens another 15,000 acres may be estimated; about 25,000 acres

are planted in fruit trees; the acreage in all crops, therefore, was, approximately, 1,634,000 acres.

The Census Office has issued a preliminary report of statistics relative to crops in 1909. The acres of cereals harvested is given as 635,807, of other grains and seeds 37,647, of sundry crops 20,575 and of hay and forage 1,135,376. The total is 1,829,405 acres. The acreage in timothy is 117,888, of timothy and clover mixed 90,541, of clover alone 11,515, of alfalfa 224,226 and of "wild, salt, or prairie grasses" 584,732. The acres covered by the last named item are wild lands, adapted for farming, that have never been plowed; and deducting them from the total of acres harvested it appears that in 1909 crops were harvested on 1,224,643 acres. The Year Book for 1909 gives the acreage in hay as 556,000; so that on this crop two government bureaus issue statistics that are widely apart. The number of arable acres that are idle may be approximated, if the total be assumed to be 30,000,000 acres, by considering the statistics in this way: Arable acres, 30,000,000; in 1909 acres harvested, 1,829,405; balance 28,170,595; or arable acres 30,000,000; crops harvested on cultivated lands, 1,244,643; balance, 28,755,357; or arable acres 30,000,000; in 1909 harvested 1,829,405; arable acres not harvested, 28,170,595; or arable acres 30,000,000; in 1909 harvested on plowed lands 1,244,643; arable acres not plowed, 28,755,357; or, based on statistics of crops in the Year Book, arable acres 30,000,000; in 1910 acres in crops 1,634,000; arable acres not in crops, 28,170,595.

Either estimate—or the result obtained by deducting from the area of farm lands the 3,640,309 acres returned by the census as improved land in farms—shows how great is the acreage of farming lands that is yet to be brought into cultivation. Among the 28,000,000 acres the homesteader has a wide range of choice; his opportunity is to secure a farm of these untilled lands which yield abundant crops when properly cultivated. Every year witnesses a remarkable increase in the amount of crops produced in Montana as the result of the bringing under cultivation of new tracts of raw land of a character similar to those that are now vacant.

Crop Statistics.

From statistics published by the Department of Agriculture the following tables have been compiled: The total acreage in 1900 in wheat, oats, barley, flaxseed and hay was 521,675; and for the same crops in 1910 the acreage was 1,542,000. The following tables exhibit the constant and wonderful increase which has been made in the agricultural production of Montana since 1899; and their significance is that the production has been chiefly on unirrigated lands that were not more promising, in many instances, than are the untilled acres that now lie ready for the plow.

The following tables show the production of the principal crops for the years named:

WHEAT.

Year.	Acres.	Bushels.	Value.	Year.	Acres.	Bushels.	Value.
1899	69,764	1,792,620	$ 1,093,690	1905	119,469	2,843,326	$ 2,018,787
1900	72,555	1,929,963	1,177,277	1906	137,389	3 297,336	2,110,295
1901	88,807	2,353,386	1,576,769	1907	139,000	4,003,000	3,242,000
1902	90,532	2,355,158	1,460,198	1908	153,000	3,703,000	3,185,000
1903	98,735	2,784,327	1,837,656	1909	350,000	10,764,000	9,364,000
1904	108,698	2,596,731	2,311,091	1910	480,000	10.500,000	9,081,000

OATS.

Year.	Acres.	Bushels	Value.	Year.	Acres.	Bushels.	Value.
1899	60,986	2,317,468	$ 903,813	1905	178,911	7,389,024	$ 3,177,280
1900	65,865	2,568,735	1,078,869	1906	196,802	8,501,846	3,740,812
1901	147,365	6,189,330	2,228,159	1907	240,000	11,760,000	5,410,000
1902	159,154	6,368,553	2,409,679	1908	254,000	10,566,000	5,177,000
1903	162,337	7,532,437	2,636,353	1909	300,000	15,790,000	6,464,000
1904	167,207	6,303,704	2,899,704	1910	350,000	13,300,000	6,118,000

BARLEY.

Year.	Acres.	Bushels.	Value.	Year.	Acres.	Bushels.	Value.
1899	6,182	216,405	$ 110,367	1905	15,227	502,491	$ 281,395
1900	5,194	201,527	96,733	1906	14,313	472,329	264,504
1901	16,398	639,522	364,528	1907	17.000	646,000	400,000
1902	17,874	661,338	337,282	1908	25,000	875,000	534,000
1903	18,231	732,886	425,074	1909	50,000	1.900,000	1,197,000
1904	17,502	523,310	324,452	1910	52,000	1,456,000	903,000

RYE.

Year	Acres.	Bushels.	Value.	Year.	Acres.	Bushels.	Value.
1901	1,834	48,968	$ 29,381	1906	2,021	41,430	$ 27,344
1902	1,871	46,775	29,936	1907	2.100	47,000	32,000
1903	1,890	46,494	29,231	1908	2,000	40,000	27,000
1904	1,871	37,233	28,669	1909	2,000	58,000	44,000
1905	1,871	37,420	24,323	1910	4,000	80,000	54,000

CORN.

Year.	Acres.	Bushels.	Value.	Year	Acres.	Bushels.	Value.
1901	3,095	77,375	$ 69,638	1906	3,986	93,132	$ 60,536
1902	3,714	81,708	58,830	1907	4,000	90,000	61,000
1903	3,788	81,291	56,600	1908	4,000	94,000	85,000
1904	3,902	86,624	58,904	1909	5,000	175,000	150,000
1905	3,941	76,451	51,989	1910	8,000	184,000	175,000

FLAX-SEED.

Year.	Acres.	Bushels.	Value.	Year	Acres.	Bushels.	Value.
1908	9,000	104,000	$ 104,000	1910	60,000	420,000	$ 1,008,000
1909	10,000	120,000	192,000	....	.....	.....	.....

HAY.

Year.	Acres.	Tons.	Value.	Year.	Acres.	Tons.	Value.
1899	361,923	513,931	$ 3,957,269	1905	362,939	580,702	$ 4,471,405
1900	369,161	590,658	5,138,725	1906	373,827	691,580	6,155,062
1901	.....	.....	.....	1907	500,000	850,000	8,075,000
1902	313,606	526,858	3,972,509	1908	525,000	1,050,000	8,768,000
1903	335,558	697,961	6,149,036	1909	556,000	995,000	9,950,000
1904	348,980	670,042	5,829,365	1910	600,000	840,000	10,500,000

POTATOES.

Year.	Acres.	Bushels.	Value.	Year.	Acres.	Bushels.	Value.
1899	4,597	648,177	$ 343,534	1905	13,688	1,642,500	$ 969,110
1900	4,781	640,654	339,547	1906	14,099	2,143,048	1,307,000
1901	.....	.....	.....	1907	18,000	2,700,000	1,350,000
1902	11,521	1,762,713	881,365	1908	20,000	2,760,000	1,932,000
1903	12,904	2,271,104	999,286	1909	25,000	4,500,000	2,295,000
1904	13,162	1,822,166	1,148,121	1910	25,000	3,000,000	2,555,000

Final statistics of the production of crops in 1911 are not yet available: but preliminary estimates indicate that on a greatly increased acreage all crops have made the normal yield of Montana per acre. This means that from an acre seeded to wheat, for instance, there will be harvested in Montana an average of nearly twice as many bushels that will sell for nearly twice as many dollars as an acre of the same crop making the average yield of wheat in the United States; or put in the form of a table, made from crop statistics for a normal year, the results will appear as follows:

Farm value of 160 acres of crops in the states named for the year 1909:

STATE.	Wheat.	Oats.	Barley	Flax Seed.	Potatoes.
Minnesota	$2,579.20	$1,848.00	$1,774.40	$2,400.00	$6,440.00
North Dakota	2,192.00	1,689.60	1,444.80	2,336.00	7,920.00
South Dakota	2,256.00	1,632.00	1,403.20	2,270.40	8.064.00
United States	2,539.20	1.963.20	2,145.60	2,294.40	9,310.40
Montana	4,259.20	3,446.40	3,830.40	3,072.00	14,688.00

The following tables show that the yields in Montana are greater not for one year alone but for every year of a long period:

AVERAGE YIELD PER ACRE OF WHEAT IN THE UNITED STATES AND IN MONTANA, 1901 TO 1910.

Year—	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910
Average of the United States	15.0	14.5	12.9	12.5	14.5	15.5	14.0	13.2	15.8	14.1
Average of Montana	26.5	26.0	28.2	23.9	23.8	24.0	28.8	24.2	30.6	22.0

AVERAGE FARM VALUE PER ACRE OF WHEAT IN THE UNITED STATES AND IN MONTANA, 1901 TO 1910.

Year—	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910
Average of the United States	$ 9.37	$ 9.14	$ 8.96	$11.58	$10.83	$10.37	$12.26	$12.97	$15.62	$12.63
Average of Montana	17.76	16.12	18.61	21.28	16.90	15.36	23.33	20.82	26.75	18.92

AVERAGE YIELD PER ACRE OF OATS IN THE UNITED STATES AND IN MONTANA, 1901 TO 1910.

Year—	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910
Average of the United States	25.8	34.5	28.4	32.1	34.0	31.12	23.7	25.0	30.3	31.9
Average of Montana	42.0	41.9	46.4	37.7	41.3	45.2	49.0	41.6	51.3	38.0

AVERAGE FARM VALUE PER ACRE OF OATS IN THE UNITED STATES AND IN MONTANA, 1901 TO 1910.

Year—	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910
Average of the United States	$10.29	$10.60	$ 9.68	$10.05	$ 9.88	$ 9.89	$10.54	$11.78	$12.29	$10.90
Average of Montana	15.12	15.80	16.24	17.34	17.76	19.01	22.54	20.38	21.55	17.48

AVERAGE YIELD PER ACRE OF BARLEY IN THE UNITED STATES AND IN MONTANA, 1901 TO 1910.

Year—	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910
Average of the United States	25.6	29.0	26.4	27.2	26.8	28.3	23.8	25.0	30.3	31.9
Average of Montana	39.0	37.0	40.2	29.9	33.0	33.0	38.6	41.6	51.3	38.0

AVERAGE FARM VALUE PER ACRE OF BARLEY IN THE UNITED STATES AND IN MONTANA, 1901 TO 1910.

Year—	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910
Average of the United States	$11.57	$13.28	$12.05	$11.40	$10.80	$11.74	$15.86	$13.91	$13.40	$ 2.92
Average of Montana	22.23	18.87	23.32	18.54	18.48	18.48	23.53	21.56	23.94	17.37

Of rye the average yields in bushels of the United States for the years 1901 to 1910 was: 15.3, 17.0, 15.4, 15.2, 16.5, 16.7, 16.4, 16.4, 16.1, 16.3, having a farm value per acre of $7.23, $7.36, $7.73, $8.51, $8.63, $8.39, $10.46, $10.07, $9.83, $11.98, $12.04, $11.87, $11.76.

In Montana the average yield in bushels per acre was: 26.7, 25.0, 24.6, 19.9, 20.0, 20.5, 22.0, 22.0, 29.0, 20.0; and the farm value per acre, $16.02, $16.00, $15.50, $15.32, $13.00, $13.53, $15.24, $13.50, $22.00, $13.50. The average yield of potatoes in the United States per acre 1898 to 1910 in bushels was: 75.2, 88.6, 80.8, 65.5, 96.0, 84.7, 110.4, 87.0, 102.2, 95.4, 85.7, 106.8, 94.4. In Montana the average yield per acre was: 104, 141, 134, 157, 153, 176, 143, 120, 152, 150, 150, 180, 120. The average farm value per acre was in the United States: $31.11, $34.60, $34.78, $50.27, $45.22, $51.99, $49.96, $53.67, $52.29, $58.86, $60.50, $58.59, $52.35. In Montana the average farm value per acre was: $57.20, $74.73, $71.02, $114.61, $76.50, $77.44, $87.23, $70.80, $92.72, $75.00, $96.60, $91.80, $102.00.

For the ten year period, 1898 to 1907, in the principal wheat producing states the average farm value per acre of wheat was: Minnesota, $8.74; Kansas, $7.56; North Dakota, $7.71; Nebraska, $9.85; Illinois, $10.62. In Montana it was $17.83. In barley, oats, corn, rye, potatoes and hay, Montana leads in a similar proportion. A statistician once compiled from figures published by the Department of Agriculture a table which proved

that in value of crop at the farm per average acre Montana was ahead of Minnesota, Illinois, Iowa, Missouri and Nebraska as follows: $8.03 per acre in wheat or 83 per cent; $10.09 per acre in barley or 105 per cent; $8.30 per acre in oats or 108 per cent; $5.03 per acre in corn or 51 per cent; $4.70 per acre in rye or 52 per cent; $32.78 per acre in potatoes or 91 per cent; $18.60 per acre in hay or 208 per cent.

Unirrigated Dent Corn.

The year 1910 was a dry one throughout the northwest and Montana did not entirely escape the effects of drouth; much new land was put in crops for the first time; in many cases the ground was not properly prepared and in others the seed was not sowed at the right time; for these reasons a short crop was expected; but in spite of these unfavorable conditions, Montana passed through a trying season and emerged with yields in all staple crops which placed it in the first rank for productiveness. While the production of North Dakota, a fine farming state, fell to $4.50 an acre for wheat and $2.59 for oats and of South Dakota, an equally fertile region, to $11.39 an acre for wheat and $6.90 for oats, the farm value of an acre of wheat in Montana was $18.92 and of oats $17.48. The story of a dry year is told in the following table:

Comparative yields for 1910, compiled from the Government Crop Reporter published by the Secretary of Agriculture, December, 1910.

STATE.	Bu. per Acre Winter Wheat.	Bu. per Acre Spring Wheat	Bu. per Acre Oats.....	Bu. per Acre Barley.....	Bu. per Acre Flax Seed...	Bu. per Acre Corn.....	Bu. per Acre Potatoes....	Tons per Acre Hay.....
Illinois	15.0	....	38.0	30.2	....	39.1	75	1.33
Indiana	15.6	....	35.4	27.0	....	39.3	84	1.30
Iowa	21.2	20.9	37.8	29.5	12.2	36.3	72	1.05
Kansas	14.2	....	33.3	18.0	8.2	19.0	57	1.15
Michigan	18.0	....	34.0	26.0	....	32.4	105	1.30
Minnesota	....	16.0	28.7	21.0	7.5	32.7	61	1.00
Missouri	13.8	....	33.6	27.0	8.4	33.0	86	1.30
Nebraska	16.5	13.9	28.0	18.5	8.0	25.8	60	1.00
North Dakota	....	5.0	7.0	5.5	3.6	14.0	41	.55
Ohio	16.2	....	37.2	28.5	....	36.5	82	1.39
South Dakota	....	12.8	23.0	18.2	5.0	25.0	44	.80
Wisconsin	20.0	18.7	29.8	25.9	10.0	32.5	95	1.00
United States	15.8	11.7	31.9	22.4	4.8	27.4	94.4	1.33
Montana	22.0	22.0	38.0	28.0	7.0	23.0	120	1.40

The Minister of Agriculture has issued an official report showing that in 1910 the average yield of grain (not of wheat alone) in the Province of Alberta, Canada, was 18.40 bushels per acre. In Montana the yield of wheat was 22 bushels and of oats 38 bushels. Comparisons both of the average yields per acre of all staple grain crops and of the value of the crop per acre at the farm of any province of Canada, or, of the whole dominion, with those of Montana are invited.

The following table presents a comparison of crop yields in the states named in a year of normal conditions:

Comparative Yields for 1909 Compiled from the Government Crop Reporter Published by the Secretary of Agriculture, December, 1909.

State.	Bu. per Acre Wheat.....	Bu. per Acre Oats.....	Bu. per Acre Barley.....	Bu. per Acre Rye.....	Bu. per Acre Flax.....	Tons per Acre Hay.....	Bu. per Acre Potatoes.....
Illinois	17.4	36.6	28.0	17.8	....	1.45	91
Iowa	18.1	27.0	22.0	17.8	9.8	1.64	89
Missouri	14.7	27.0	25.0	15.0	8.1	1.35	85
Nebraska	16.7	25.0	22.0	16.5	8.5	1.50	78
Kansas	13.0	28.2	18.0	14.2	7.0	1.45	79
Minnesota	16.8	33.0	23.6	19.0	10.0	1.75	115
Wisconsin	19.7	35.0	28.0	16.3	14.5	1.53	102
Michigan	18.8	30.5	24.7	15.5	....	1.30	105
Indiana	15.3	30.5	28.5	16.5	....	1.40	95
Ohio	15.9	32.5	25.9	17.2	....	1.43	93
North Dakota	13.7	32.0	21.0	18.3	9.3	1.37	110
South Dakota	14.1	30.0	19.5	17.5	9.4	1.50	80
United States	15.8	30.3	24.3	16.1	9.4	1.42	106
Montana	30.6	51.3	38.0	29.0	12.0	1.79	180

Montana in Competition With the World.

Nearly every product of the soil that will mature in the part of the United States that lies north of a line running east and west through Cincinnati, Ohio, may be successfully grown at some place in Montana. The average yields of wheat, oats, barley, flaxseed, potatoes and hay, the principal crops, far surpass the average of the states most noted for their agricultural productions. The fertility of the soil, the favorable climatic conditions, the timeliness of the rainfall, and the abundance of the sunshine account for the wonderful crops. The yields are not only prolific in quantity but are also of a superior quality, and as a consequence Montana farm products win prizes whenever and wherever they are placed in competition with the best products that can be collected in other states and in other countries for purposes of exhibition.

At the World's Columbian Exposition held at Chicago, in 1893, besides awards to the State of Montana for "Gold Nuggets, Crystals and Placer Gold," for "Collections of Silver and Silver Crystals," for "Copper Ores," for

"Coal," for "Building Stones" and for "Montana's Statue of Justice" (in silver), awards were given to the State and to exhibitors from the State, for agricultural and horticultural exhibits, as follows:

The Gold Medals Awarded to Montana Exhibitiors.

CHICAGO WORLD'S FAIR, 1893—AWARDS TO MONTANA EXHIBITS.

Apples; Collective Exhibit of Flax Seed; Oats; Hay:	State of Montana.
Flour:	Bozeman Milling Co.; Elling & Hyndman; R. M. Herold; Nelson Story.
Barley:	J. W. Dawes; M. M. Ferguson; Samuel Fowler; Manhattan-Malting Co.
Wheat:	William Caldwell; J. Mason.
Hay:	Bailey & O'Donnell.
Timothy Hay:	Thomas Blake; Mrs. Ed. Duke.

At the Louisana Purchase Exposition held at St. Louis in 1904, the Grand Prize for the Mining Industry was awarded to the State of Montana. The State of Montana was awarded a gold medal for fruit; Bass Brothers of Stevensville received a gold medal for apples; and the Bitter Root Farm of Hamilton a gold medal for "Apples and Crab Apples." Thirty-eight silver and 23 bronze medals were received by various exhibitors from Montana for apples, crab apples, strawberries, plums and prunes. For agricultural exhibits from Montana the awards were: Gold medals, 69; silver medals, 62; bronze medals, 53.

ST. LOUIS EXPOSITION, 1904—GOLD MEDALS AWARDED TO MONTANA EXHIBITORS FOR AGRICULTURAL PRODUCTS.

Barley:	Duncan Cameron, Cascade; B. H. Kemp, Cascade; A. H. Sales, Salesville.
Barley and Oats:	C. F. Anderson, Belt; J. E. Morse, Dillon; P. R. Nash, Bozeman; James A. Potter, Bozeman.
Barley, Oats and Wheat:	E. M. Davidson, Belgrade; W. C. Newton, Bozeman; Daniel Payne, Monarch; Robert Scott. Sand Coulee.
Barley, Wheat, Oats, Rye and Speltz:	Experiment Station, Bozeman.
Barley, Wheat, Rye and Oats:	E. Bisson, Great Falls.

Beans:	Frank Rene, Echo.
Beans and Peas:	Samuel Dick, Great Falls.
Bromus Inermis:	J. R. Krueger Plains; Christ Prestbye, Kalispell.
Hay—Alfalfa:	Paul McCormick, Billings.
Hay—Timothy:	J. M. Horan, Belt.
Hay:	Claude V. Flynn, Toston.
Hay Seed—Timothy:	Ed Peterson, Kibbey.
Irrigated Products:	Montana Commission.
Oats:	F. K. Armstead, Bozeman; A. M. Austin, Flathead; C. H. Austin, Flathead; O. H. Barnhill, Holt; Joseph Braithvant, Highwood; Henry Brush, Chinook; James Cook, Chinook; Wallace Cook, Chinook; C. R. Featherly, Dillon; John H. Green, Plains; Frank Harlen, Missoula; B. J. Heaney, St. Peter; J. M. Horan, Townsend; Carl Innes, Dillon; Otis Johnson, Plains; J. H. Lamphear, Manhattan; C. H. Lind, Great Falls; Con Mannix, Townsend; Theodore Nelson, Dillon; Theodore Norman, Bozeman; C. E. Skidmore, Bozeman; G. W. Sparr, Bozeman; Leonard Stone, Central Park; Chas. Stephens, Highwood; J. H. Stubbs, Kalispell; M. D. Sullivan, Townsend; Otis Thompson, Plains; C. Van Wagen, Laurel, and M. L. Wade, Chouteau.
Oats and Wheat:	C. M. Anderson, Belt; W. R. Callen, Monarch; Jacob Carolus, Bozeman; John C. Coulson, Cascade; C. A. Lee, Sand Coulee; J. J. Patterson, Truly; C. W. Winslow, Waterloo, and W. L. York, Riceville.
Vegetables—Collective Exhibit of:	Montana Commission.
Wheat:	Pete Fake, Eden; H. Hicke, Truly; G. P. Kessner, Stockett; Joe Manxer, Eden; Charles Morgan, Truly; John R. Ross, Great Falls.

At the Lewis and Clark Centennial Exposition held at Portland, Oregon,, in 1905, the State of Montana was awarded a gold medal for "Educational Exhibit," gold medal for "Collective Exhibit of Grains and Grasses," gold medal for "Mineral Exhibit," and gold medal for "Gold Exhibit."

In the agricultural exhibit the following awards were made to Montana: Gold medals, 62; silver medals, 13; bronze medals, 2. Each exhibitor from Montana of horticultural products received a medal.

PORTLAND EXPOSITION, 1905—GOLD MEDALS AWARDED TO MONTANA EXHIBITORS FOR AGRICULTURAL PRODUCTS.

Barley:	Manhattan Malting Co., and J. P. Stone.
Barley and Oats:	J. E. Morse.
Barley and Wheat:	W. J. Bowers.
Barley and Timothy:	Ed. Peterson.
Barley, Wheat and oats:	Nash Bros., and C. R. Gearch.
Barley, Spring Rye and Wheat:	Manhattan Malting Co.
Bromus Grass Seed, Wheat, Oats and Flax:	C. Prestbye.
Flax and Oats:	P. R. Nash.
Oats:	John Kinner, Mrs. A. Lock, J. Carolus, C. Van Wagner, W. A. Little, G. N. Featherly, John H. Stubbs, John McKennick, Pabst Steel, S. Holmstead, Thomas Bauers, Thomas Nelson, J. E. Morse, Clark Harlan, W. C. Newton, C. Mancat, George Bentley, C. W. Winslow, Carl Innes, Charles King and U. Marte.
Rye:	C. H. Campbell, E. E. Wilcox.
Rye and Wheat:	C. H. Lindle.
Timothy Seed:	J. C. Gibson.
Wheat:	Thomas Kening, A. C. Vanderpool, James Baker, S. D. Luce, S. Holmsland, H. F. Peterson, E. F. Mann, A. H. McMillan, Daniel Cummings and George Sparrel.
Wheat—Macaroni:	John Epperson.
Wheat and Oats:	John Baumgardner and Otis Johnson.

PORTLAND EXPOSITION, 1905—MEDALS AWARDED TO MONTANA COUNTY EXHIBITS.

County	Kind of Medal	Medal Awarded for
Beaverhead	Gold	Grains, Grasses and Decorated Panel.
Cascade	Gold	Grains and Grasses.
Flathead	Gold	Grains and Grasses.
Gallatin	Gold	Grains, and Grasses Used in Decoration of Panel.
Missoula	Silver	Grains, and Grasses in Sheaf and Decorated Panel.
Ravalli	Silver	Grains and Grasses.
Yellowstone	Gold	Grains and Grasses in Sheaf.

At the Dry Farming Congresses, held at Cheyenne in 1908, at Billings in 1909 and at Spokane in 1910, Montana won so many prizes that space cannot be spared to name them. A notable triumph was the winning at the Congress of 1910 by George Betzer of Somers, Flathead county, of the silver cup valued at $100.00, offered by the Lethbridge, Canada, Board of Trade for the best box of McIntosh Red Apples. Ben Kress of Hamilton, Ravalli County, won first prize for McIntosh Red Apples at the Spokane Apple Show of 1909.

At the Third National Corn Exposition held in December, 1909, at Omaha, Nebraska, in the sweepstakes for wheat, grown in the western part of the United States, Gus. Siegeling of Armington, Cascade County, won the first prize. In sweepstakes open to the world, H. F. Albrecht, of Kalispell, Flathead County, won first prize for the best sheaf of field peas; B. F. Booker, of Helena, Lewis and Clark, the first prize for marrowfat peas; and Gus. Siegeling of Armington the first prize for the best peck of navy beans. On a later page will be found a list of the prizes won by Montana exhibits at the Dry Farming Congress of 1911 and at the New York Land and Irrigation Exposition.

The Best Barley in the World.

At the National Irrigation Congress which was held at Salt Lake City some years ago, the large, beautiful, and costly Pabst cup was awarded to the Manhattan Malting Co., of Manhattan, Gallatin County, for the best brewing barley raised in the United States. The variety shown was the Saale or Chevalier barley.

In 1889, Mr. Henry Altenbrand of New York and Manhattan, Montana, who has been prominently connected with the malting business for twenty-five years, procured from Germany 2,000 bushels of Saale barley, a variety possessing superior malting qualities. This seed was planted in Wisconsin, Minnesota, Iowa, Illinois, New York and Montana. At the end of the season samples of the barley grown in these different states were carefully collected and compared with the original seed in the hope of finding a section of the country especially adapted for the growth of this cereal. All samples showed deterioration in quality and appearance except those grown in Montana, which showed wonderful improvement on the imported seed, being fuller, heavier in weight and brighter in color. It has become an

The Silver Medal Awarded to Montana Exhibitors.

important crop in Montana and has been exported in large quantities to England, Germany, Norway, Japan, and Australia.

On its first appearance in Europe it created a sensation. In 1893 the Imperial German Government sent a commission to investigate the grain growing regions of the United States. The Commission visited various parts of the country including the Gallatin Valley in Montana. Prof. Delbruck, Chief Commissioner of the Department of Agriculture of Germany, was at the head of this commission and says in his report: "Barley that is damaged by rain is unknown here, for there is no rain; withered or dried-up barley is equally unknown for the Gallatin River furnishes water in abundance. A country and a system of cultivation ideal for barley growing; in fact, here I have seen the finest barley grown in the United States. For the most part Saale barley is used for seed and grown with admirable results; bright in color, large in size, fine as to husk, equal to the very best European barleys, and conspicuously superior among the barleys of North America."

The Facts Summed Up.

The productiveness of Montana's soil has been proven by the statistics that have been given of crop yields, and the quality of the product by the prizes Montana exhibits of grain have won at great fairs.

Wheat, which is the main crop, grades high and is of excellent milling quality. Both spring and winter varieties are grown. Turkey Red, a winter variety, is the leading crop on unirrigated land. Durum wheat has been grown with profit.

The tables that show the money value of an acre of wheat and of other grains are of particular interest because they state the value of the crop at the farm where it was raised. Cost of transportation to the great grain markets do not enter into these statistics.

The cost of production of a bushel of wheat is lower in Montana than in any other state, being 44 cents, against an average of 66 cents for the whole United States.

There are three markets for Montana wheat, the eastern, the western and the local. An increasing quantity is being bought every year by local flouring mills whose products find a ready sale within the state, on the Pacific Coast, and in the Orient. Duluth is the eastern, and Seattle or Portland the western, market.

A bushel of oats weighs not less than 40 pounds (one of 55 pounds weight is reported), and many bushels are exported for seed and to cereal

mills. Montana barley has added quality to famous malt products and has been shipped in large quantities to Germany, England, Australia, and Japan. Alfalfa seed has been sent to distant parts of the United States and Canada. Hay has been shipped to the Philippines; sugar made from Montana sugar beets has sold as far east as St. Paul; Montana potatoes are featured as a special luxury in railway dining cars; cherries from Flathead county are a delicacy appreciated in New York; and the excellence of the Montana McIntosh Red apple is known in London.

There is less danger of a crop failure or of a short yield in Montana than in other states. The following table shows, in bushels, the highest and lowest yields during the period extending from 1900 to 1910:

State.	High Yield	Low Yield.
North Dakota	15.9	5.0
Minnesota	16.8	10.9
Kansas	18.5	10.4
United States	15.8	12.5
Montana	30.8	22.0

For the period 1900-1910 the following comparisons may be drawn from the government crop statistics:

The lowest yield of Montana was greater than the highest yield of North Dakota, of Minnesota or of Kansas by 14%.

The lowest yield of Montana was greater than the highest yield for the United States by 39%.

The lowest yield of Montana was greater than the lowest yield for the United States by 76%.

The highest yield of Montana was greater than the highest yield of North Dakota, of Minnesota or of Kansas by 61%.

The highest yield of Montana was greater than the highest yield for the United States by 95%.

Silver Cup for McIntosh Apples,
Won by George Betzer at the Spokane Apple Show 1910.

Montana, 543 miles long and 280 wide, has 93,296,640 acres of land surface.

Mountain Lands, 30,000,000 Acres.

MINERALS:
- Copper
- Gold
- Silver
- Lead
- Sapphires
- Coal
- Iron

FOR RECREATION:
- Grand scenery
- Great glaciers
- Lovely lakes
- A wonderful cave
- Hunting and fishing
- A delightful climate

TIMBER:
- Pine
- Fir
- Spruce
- Larch
- Cedar
- Cottonwood

Grazing Lands, 30,000,000 Acres.

Wool, Sheep, Angora Goats, Cattle, Mules and Horses

Farm Lands, 30,000,000 Acres.

CROPS:
- Wheat
- Oats
- Barley
- Corn
- Flaxseed
- Hay

Farm lands,	-	30,000,000 acres
In cultivation	-	2,000,000 acres
Waiting for the plow,		28,000,000 acres

Size of area cultivated in proportion to all farm lands.

HORTICULTURE:
- Apples
- Cherries
- Plums
- Pears
- Peaches
- Berries

COAL—
303,060,000,000 tons.

TIMBER—
50,000,000,000 feet.

Montana

First in copper
First in larch lumber
First in yield of wheat and oats per acre
First in acreage of virgin farm lands
First in wool
First in sheep

HYDRO-ELECTRIC POWER—
unlimited quantities of.

MANUFACTURES—
Raw material and a local market for.

MONTANA'S NATURAL RESOURCES.

THREE KINDS OF LAND.

Farm Lands—Grazing Lands—Mountain Lands.

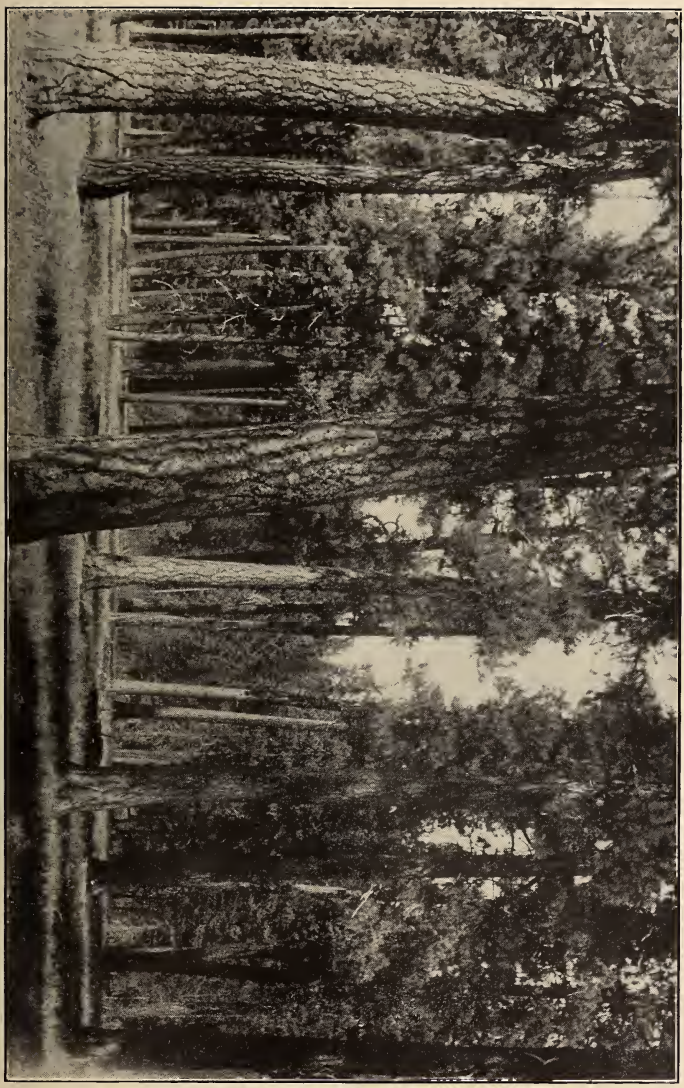
Montana lands fall about equally into three classes viz: Farm lands, Grazing lands and Mountain lands. Each class comprises about 30,000,000 acres; in each a particular industry is the dominating—but not exclusive—one; each contributes a valuable share to the sum total of the state's natural resources; and the development of each helps the others. Lands of the three classes sometimes lie close together; there is no sharp line of distinction between them and their boundaries are not defined; at places farm lands abut on mountains; oftener the order is: Farm lands, foothills valuable for grazing, and mountains covered with timber; the transition from lands of one class to those of another is sometimes very gradual; but, on the other hand, the topography often clearly indicates the use for which the land is suited.

Mine in Broadwater County.

The mountain lands contain the mineral areas and the forests; there are the sources of the streams that supply water for irrigating ditches and for conversion into electric power; they afford summer pasturage for live stock; and in them are found the places that attract the tourist and the hunter of big game. The grazing lands support the great live stock industry. The farm lands include all lands that are suited to the cultivation of crops or of horticultural products.

The natural resources of lands of the last two named classes have been developed to an extent that the annual production of wealth from mines and from the sale of horses, cattle, sheep, and wool reached a great figure years ago and has since been maintained at a high level. Other sources of wealth there have always been, agricultural production one of them; but not until a recent period did Montana enter upon the new era of agricultural development. Thousands of new settlers have come in and many thousand acres of raw land have been put in cultivation; although only a beginning has yet been made what has been accomplished, makes it evident that the farms of the state will soon be producing more wealth than the mines or the stock ranches. There is room for all three industries to grow and prosper.

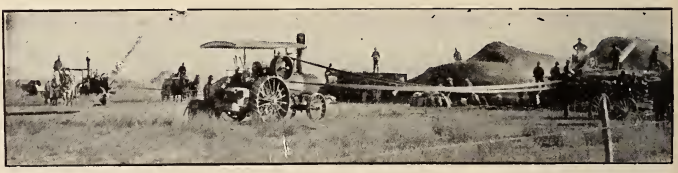
The mineral areas have not been fully prospected and many known



A Forest in Lincoln County.

mineral deposits lie idle for want of capital to work them. The mines of Butte are producing at lower cost than ever and show no signs of exhaustion; other copper camps should soon become large producers and a revival of activity in mining ores of gold and silver is noticeable throughout the state. In many districts capital is becoming interested and work is being done on many claims that will make them producing mines. The live stock industry is undergoing a readjustment to meet changed conditions. The lands fit for farming that were included in great stock ranches have become too valuable for use as pasture and the range has been invaded by homesteaders who are turning it into farms. As a consequence of this new condition many stock ranches have been sold and cut up into farms of moderate size. The area of lands too rough for farming, at too high elevations to mature crops, or at a distance from a railroad too great to make farming profitable, is very great and will always be devoted to grazing live stock. The number of work horses, of small herds of cattle and of small flocks of sheep, kept within fences, is increasing; and the outlook is that for every future year Montana will turn out more and better live stock than it ever produced in the palmiest days of the range.

The lands level enough to be cultivated with the machinery commonly used in farming operations are classified as arable lands. They have been estimated to be 30,000,000 acres, and may be compared with the 7,278,720 acres of Belgium, the 8,094,720 acres in Holland and the 9,848,320 acres in Denmark—a total of 25,221,760 acres. Massed in one body Montana's 30,000,000 acres of farm lands nearly equal Iowa's total acreage, including water surface, swamp, and bluff lands, of 35,856,000; Illinois contains but 36,256,000 acres; Ohio, 26,278,000; Indiana, 23,264.000, and Kentucky, 25,856,000; Montana's farm lands are as extensive as the whole surface of some great farming states; and the other two-thirds—the grazing and mountain lands—in wealth of pasture, of minerals, timber, and scenic attractions, surpasses any similar area in the United States.



FARM LANDS.

Varieties of Crops Grown—Irrigated and Unirrigated Farm Lands—Each Has Advantages.

The farms of Montana are: (1) Irrigated and (2) Non-Irrigated. The census of 1910 reports the number of farms in the state to be 26,214, of which 8,970 were irrigated and 15,244 non-irrigated. Certain features of climate, rainfall and soil are common to both. In so large a state the character of the soil at one place may be quite different from that at another; soils of many different kinds indeed are found; but in the whole state the number of acres on which some useful plant does not—or cannot—grow is relatively small. No soil survey of Montana has been made; although limited areas in two or three counties have been mapped and described only a beginning has been made in this important work. The Montana Agricultural Experiment Station at Bozeman, however, may be consulted as to the character of the soil of any particular district as it has collected data on the subject from many neighborhoods. The general statement may be made that throughout Montana the soil is rich in the primary elements of fertility; it has not been impoverished by the constant leaching which takes place in regions of heavy rainfall, nor, in the cultivated areas, by a succession of exhausting crops.

Corn on W. B. George's Ranch.

At high altitudes the seasons are short; above certain elevations no crops will mature; at the lowest elevations tomatoes, canteloupes and tender vegetables thrive; below 6,000 feet elevation most of the vegetables and grains common to the northern part of the United States make good yields. Corn is becoming an important crop in certain sections, both for the ripened grain and for forage, on lands not above four thousand feet in elevation. Topographical conditions modify the temperature, the winds, and the frosts, and should be considered before a location is made, especially if fruits or tender vegetables are to be raised.

The climate, which varies somewhat with the sections, is favorable

to the growth and maturity of nearly every crop grown in the northern half of the United States.

An idea of the variety of farm products grown may be had from the premium list of the Montana State Fair at which the prizes offered for the best specimens of the products named are keenly competed for viz:

Cabbage Patch.

Class 1.—Grains and seeds: Soft winter wheat, hard winter wheat, soft spring wheat, hard spring wheat, macaroni wheat, spring rye, winter rye, white oats, colored oats, 2-row barley, 6-row barley, hulless barley, buckwheat, white field peas, millet seed, timothy seed, orchard grass seed, Hungarian grass seed, blue grass seed, mammoth clover seed, red clover seed, flax seed, yellow dent corn, white dent corn, white flint corn, yellow flint corn, sweet corn, pop corn, alfalfa seed, navy beans, brome grass seed, and blue joint seed.

Class 2.—Vegetables: Cucumbers, best gallon pickling cucumbers, Hubbard squashes, Boston marrow squashes, field pumpkins, largest pumpkin, largest squash, late cabbage, early cabbage, red cabbage, celery, Lima beans, string beans, cauliflower, red tomatoes, yellow tomatoes, muskmelons, citrons, watermelons, peppers, sugar cane and tobacco.

Class 3.—Root Crops: Rutabagas, flat turnips, globe turnips, carrots for table use, carrots for stock, horseradish, table beets, turnip beets, sugar beets, red mangelwurzels, yellow mangelwurzels, white mangelwurzels, parsnips, turnip radishes, winter radishes, summer radishes, red onions, yellow globe onions, white pickling onions, red onion sets, white onion sets, early white potatoes, late white potatoes, early red potatoes, late red potatoes.

Division F.—Fruit and Horticultural Products—Apples: McIntosh, Alexander, Spitzenberg, Northern Spy, Wealthy, Duchess, Snow, Yellow Transparent, Jonathan, Gravenstein, Northwest Greening, Red Checked Pippin, King of Tompkins County,

Rhode Island, Greening, Bethel, Rome Beauty, Wolf River, Bioni, Baltimore, Akin, Bellefleur, crabs; peaches, apricots, pears, blue plums, yellow plums, red plums, cranberries, grapes, and cider.

No premiums seem to have been offered for several varieties of apples that were shown at the fair; for the strawberries, ripe during the last week of September, 1911, that were in the Sanders county display; or for broom corn, nectarines, peanuts or sweet potatoes, that have been successfully grown on a small scale in several parts of the state.

One reason for the luxuriance of the crops grown in the state in a comparatively short growing season which is not understood by those that live in a lower latitude is that the percentage of sunshine is greater in Montana than in other states. Throughout the upper and central sections of the Mississippi Valley the percentage of sunshine received is reported to be about 45 per cent of the possible amount while in Montana this

Irrigated Onions.

percentage rises to 60 per cent or more. Other conditions being equal it is evident that the plant that receives the greatest amount of sunshine, if not too much, will make the best progress and development. There are, it seems, during the growing season four hours of sunshine in Montana to every three hours in the Mississippi Valley; and, as the nights are cool and blistering heat or winds very rare, crops grow as much in three months in Montana as they do in four in the Mississippi valley. Another reason is the timeliness of the supply of moisture to the soil.

In many states an excess of rainfall often results in great damage to crops and causes disastrous floods. Montana is free from this danger. While the annual rainfall is not large the amount of precipitation during the growing season when moisture is needed for plant growth equals that in so-called humid states. On irrigated land water is put whenever needed. F. H. Ray, register of the state land office, has compiled from the reports of the United States Weather Bureau, a table that shows that the precipitation in Montana during the months of April, May, June, July and August is 8.6 inches as against 8.2 inches for the same months in the Willamette Valley, Oregon. The comparison is of the average of 34 Montana stations with the average of 9 stations in Oregon, including Portland. The time-

liness of the rainfall, the fertility of the soil, and the abundance of sunshine account for the wonderful yields on unirrigated land in Montana.

There are parts of the state where the natural rainfall provides sufficient moisture for the crops and where it is not necessary either to irrigate or to conserve the moisture by the dry farming system of cultivation. A part of western Montana and portions of Cascade, Fergus, Gallatin and of other counties are in this condition. The area of such lands, however, cannot be stated; nor have records of crop yields been kept for a sufficient number of years in some of the counties where farming without irrigation is a new industry to prove that it would not be advisable to conserve the natural rainfall by the methods recommended for dry land farming.

The annual rainfall is low; and for the successful production of crops it is generally necessary to supplement the moisture furnished

Treshing Near Dillon.

by falls of rain and snow by water brought on to the land in ditches—which is farming by irrigation—or to conserve the moisture that has been precipitated by Montana methods of scientific dry farming—which is dry land farming.

Prof. Alfred Atkinson, agronomist of the Montana Agricultural College, has compared the two classes of farm lands and the two systems of cultivation in the following observations:

"Irrigation means intensive tillage on restricted areas. There are limitations of capital because these lands are high priced and limitations of labor because of the large demands made by intensive methods, the work of applying the water, and the heavy crop production. These restrictions are compensated by the large acre returns in products, making the handling of large areas unnecessary as well as impracticable.

"On the other hand, dry farming as at present understood involves the handling

of a double area. A tract under summer cultivation each season without crops equal to that upon which crops are growing. The yields are generally lighter even with the fallow method than where irrigation waters are used. The labor is also less, so that much greater areas may be annually cropped above the ditch.

"Added to this is the fact that without irrigation ditches the larger power implements of tillage are more adaptable. Plowing, harrowing and harvesting may be rapidly accomplished with a minimum of labor. It becomes possible for each man to handle a vastly greater area than he could possibly do under irrigation.

"When the question comes down to the earning capacity of a man, it is an open one whether he can earn more on dry or on irrigated land.

"Land areas are so great that the acre unit does not count for much here. Every man may have all he can take care of. It is not a race to see how many

Irrigating Flume Crossing Gulch.

people can live on an acre as in China, India or Germany. How many persons can an acre support is not a Montana question, nor will it be for many years to come. The real question is, 'How much can a farmer earn?' Give him all the land he can handle, how much can he earn? Can he earn more on irrigated land or above the ditch?

"There is plenty of room for argument on both sides of this question, and there will be plenty of room for demonstration and trial in Montana for years to come."

IRRIGATED FARMS.

Some Good Yields—A Farmer's Balance Sheet.

All crops make their largest yields on irrigated land and there is never a crop failure when the supply of water is ample. All grains, grasses and vegetables make great yields on these lands. A world's record yield of oats was made in 1909 when Rudolf Vogel, Jr., grew on his irrigated farm near Bozeman 488 bushels of oats, weighing 43 pounds to the bushel, on two and one half acres of ground. On one acre near Laurel Charles King raised 1,213 bushels of potatoes, according to the Laurel Sentinel. Alfalfa and sugar beets are profitable crops which are grown nearly exclusively on irrigated land. The manager has published statistics of some good yields that were grown in Yellowstone and Carbon Counties for the Billings Sugar factory in 1910. The fifty growers had 1,438.30 acres in sugar beets, the average yield was 16.74 tons, and the average amount that was paid the farmer for his beet crop was $100.30 per acre. The names and addresses of some of these successful farmers together with details of their crops are given below:

Name and address.	Acres Harvested.	Tons Per Acre.	Value Per Acre.
P. Young, R. F. D. 1, Joliet	6.9	21.02	$131.85
C. L. Wilcox, 118 Clark Ave., Billings	48.0	19.54	114.91
Dorothea Matar, R. F. D. 1, Billings	8.0	17.56	111.69
C. L. Nelson, Rockvale	6.0	17.96	111.17
R. M. Hughes, Rockvale	34.0	17.94	110.65
T. F. Moore, R. F. D. 2, Billings	26.13	19.66	110.37
R. V. Denton, R. F. D. 1, Billings	40.00	18.47	109.67
J. A. Fear, Belfry	12.42	18.17	109.62
Krum & White, R. F. D. 1, Joliet	15.20	17.81	109.53
Mrs. O. M. Alford, Ballantine	2.75	20.10	109.25
Geo. R. Lee, R. F. D. 2, Billings	18.39	17.62	107.77
Clawson & Orr, Rockvale	31.0	17.34	107.08
A. F. Hiser, R. F. D. 1, Joliet	29.58	17.68	107.08
H. B. Neff, Laurel	47.0	17.35	106.94
Krum & Baker, R. F. D. 1, Joliet	15.0	17.56	105.00
Yost & O'Donnell, Billings	245.0	18.21	104.52
T. Maruhayashi, Park City	25.0	17.03	104.09
C. R. Parsons, Edgar	12.5	17.74	102.44
Lars P. Larson, Bridger	11.09	16.12	101.84
A. Nomura, Bridger	33.53	16.36	101.14
Joseph Graham, Fromberg	3.5	17.71	100.92
E. L. Grewell, Joliet	41.0	16.22	100.11
J. B. Devitt, R. F. D. 1, Billings	19.5	16.37	100.03

Director Linfield of the Montana Agricultural Experiment Station has been told of the crops that were raised on a farm of 60 acres, five miles

from Bozeman, by George Allen several years ago. He had about 30 acres of wheat that averaged from the machine about 80 bushels to the acre, and about 30 acres in oats which went 100 bushels to the acre. He had some clover which yielded about 4 tons to the acre. He had an acre or so in potatoes, kept a few cows, and a number of chickens. Thegrose returns from his little farm were about 84,500.

Potato Field.

What two farmers realized for their 1911 crops the Bozeman Republican Courier states in these words:

Frank Heiskell, one of the successful ranchers of the valley and whose farm lies west of the West Gallatin river, Saturday contracted to sell his wheat crop to Thomas B. Quaw, the local grain dealer, the price being at the rate of $47 per acre. Mr. Heiskell has 54 acres in Crail fife wheat that average 70 6-10 bushels to the acre. This, it is believed, is a record for Montana.

Mr. Quaw also bought the barley of Thomas S. Kirk, whose ranch adjoins that of Mr. Heiskell. The price paid for this barley was $1.75 per 100 pounds. Mr. Kirk has 300 acres in barley that went 65 bushels to the acre. The total price paid by Mr. Quaw for the Kirk barley crop was $17,500.

Many reports of crop yields on irrigated lands have been collected by the companies that control the lands within the Carey Act projects and by officers of the United States Reclamation projects. From all irrigated districts are reports of remarkable crop yields.

The soil of Montana is practically perfect, the sunshine is abundant, and where water is furnished by irrigation canals an ideal condition for farming exists. The soil, contains the chemical elements necessary for plant life, water is the element which dissolves the chemicals, and the sunshine supplies the mysterious power by which these elements are conveyed to the plant. The farmer of irrigated land because he controls the supply of water receives the greatest benefits from the three elements. He may control them with as certain results as the owner of a factory controls the tools that he employs to create a finished product. The irrigation farmer is able to give to his crop at the right time the quantity of water that will produce the best results. He scientifically manufactures products.

A Farmer's Balance Sheet.

I. D. O'Donnell, one of the most successful farmers in Montana, has given out the following account of his operations on the Hesper Farm for last year and it is interesting as showing what a well managed irrigated farm pays:

A great many of my friends have been interested in the workings of my Hesper farm for the season of 1910-11 so that I have decided to make a report of just what it did for the year. April 1st, 1910, to April 1st, 1911.

In the first place I will explain that the sugar beets are all grown by Germans on the shares. They do all the work and furnish nearly all their own stock, machinery, etc., and deliver the beets at dump. I furnish seed and manure. They get three-fourths and I one-fourth. The alfalfa the Germans irrigate, cut, stack and feed for $3.50 per ton, the grain and other things on halves. I keep the orchard and trees. I also keep one man the year around at $60 per month and board himself, who looks after the orchard, fences, bridges and roads and cares for the sheep while in feed lots. I pay all taxes, water assessments and permanent improvements.

The accounts of the farm are run in three main accounts. Ranch account, sugar beet account and sheep account, and in the figures given below only the totals of debits and credits will be given.

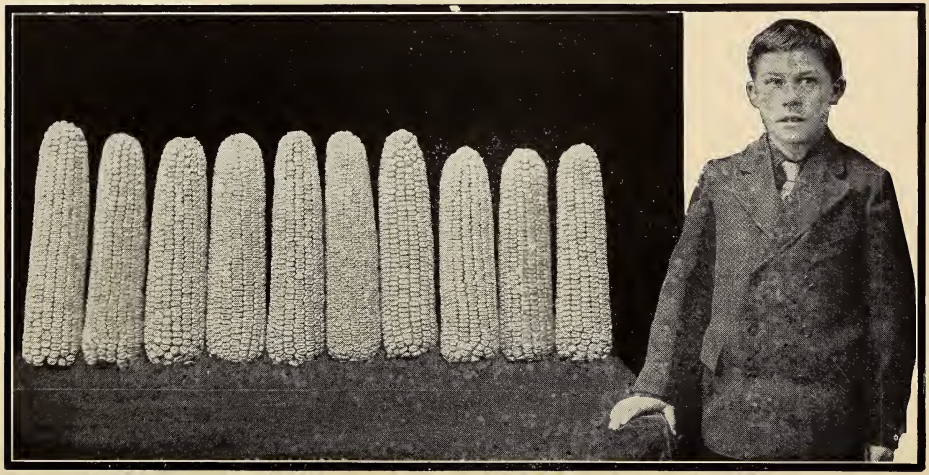
The farm is ten miles west of Billings, consists of 640 acres irrigated land and the beet ground averages about one mile haul to beet dump.

Thirty-two head of first class work horses were used in the operating of the place. The census man found seventy-seven people living on the farm.

Winter Wheat at Valier.

Ranch Account.

Debit—	
One man, 8 months at $60	$ 480.00
Seed (alfalfa and oats)	240.00
Telephone	36.00
Hardware	53.00
Lumber and apple boxes	80.00
Insurance	52.00
Taxes and water assessment	750.00
Hay, irrigating, cutting and feeding	3,300.00
Livery and feed	52.00
Extra labor, threshing and picking apples	250.00
Total	$5,293.00
Credit—	
Hogs	$ 468.00
Apples	1,070.00
Alfalfa pasture	350.00
1,100 tons hay at $5 a ton	5,500.00
Grain sold	350.00
Total	$7,738.00
	5,293.00
Net profit	$2,445.00



Ignatius O'Donnell, Jr., of Billings, Winner of the Corn Growing Contest of 1910, for Boys and Girls.

The Germans' profit on ranch work about made them their stock feed and their own living clear. Each family had their own gardens and pasture for cow.

Sugar Beet Account, 230 Acres.

Debit—	
Seed	$ 489.00
Drill	23.00
Three-fourths to Germans	18,212.64
Total	$18,724.64
Credit—	
Received for beets, 230 acres	$24,283.54
230 acres beet tops charged to sheep	1,150.00
Total	$25,433.54
	18,724.64
Net profit	$ 6,708.90

Figuring $45 per acre as to total cost of growing and harvesting the beets, the Germans made a net profit of $7,862.00 on the beets.

It required the full force of 32 work horses to put in beet crop and again at harvest. Twelve teams and wagons were required for six weeks to do the hauling to the railroad.

Sheep Account.

Debit—	
Cost of 8,000 wethers including commission	$26,906.75
Expense bringing to farm, salt and herding	237.10
230 acres beet tops (beet account credit)	1,150.00
Alfalfa pasture (ranch account)	350.00
Yard man for 4 months	240.00
1,100 tons hay at $5 per ton (ranch account)	5,500.00
Interest on sheep loan	633.00
Total	$35,016.85
Credit—	
Received for sheep	$39,248.40
Received for pelts	29.90
Total	$39,278.30
	35,016.85
Net profit	$ 4,261.45

The beet tops at $5 per acre were cheaper feed than alfalfa at $5 per ton.

Total.

Ranch account profit	$ 2,445.00
Sugar beet account	6,708.90
Sheep account	4,261.45
Net profit for farm	$13,415.35

Farm land in the vicinity of Hesper farm is valued at about $100 per acre. The above figures show 21 per cent on $100 per acre or 7 per cent on a $300 per acre valuation.

Typical Plan for Valley.

I am trying to run the farm on what I think is the typical plan for this valley, that is, sugar beets, alfalfa and stock feeding. In doing this I plow up alfalfa for sugar beets, grow two crops of beets, then fertilize for the third crop. The fourth year it is put into oats and seeded back to alfalfa.

The feeding of all alfalfa on the farm gives us the fertilier to go back on the place. We put out about 2,400 tons of manure each year and in that way keep the farm in a high state of fertility.

The oats last year averaged over 100 bushels per acre. Beets over 18 tons and alfalfa a little less than five tons.

Enough timber is being grown on the farm for the fuel supply.

THE PROGRESS OF IRRIGATION IN MONTANA.

Early Development—Irrigable Area—The Carey Act Projects—The Government Reclamation Projects.

It has been estimated that in Montana are 8,000,000 acres that should be classed as irrigable lands. Many of the first settlers had seen the irrigated farms of the Salt Lake basin and of California and supposed crops would not grow in Montana without irrigation. Farming began in valleys near placer mining camps, where the products were marketed, and where water was easily obtained. Water sufficient to irrigate small tracts was conducted from adjacent streams in ditches dug by individual farmers. When tracts owned by several farmers were to be irrigated the advantages of co-operation were realized and all who were to be benefited united and formed a partnership or an irrigation canal company. In labor or money each contributed his proportionate share of the cost of the enterprise and secured the right to a specified amount of water. A few companies acquired large tracts of land, brought water from a distant point, and divided the tract into farms that were sold with water rights. As population increased settlements were extended; lands within Indian reservations were ceded and occupied; railroads were constructed and by making possible the shipment of products to market encouraged farming; and the acres irrigated by ditches owned by individuals, by partnerships, by co-operative companies and by land companies greatly increased. In the course of time the greater part of the land to which water could be brought at moderate cost became irrigated. The construction of large and costly ditches that presented engineering difficulties was not feasible with limited capital and with defective laws relating to water; capital found more attractive investments than the construction of irrigating canals in a country so sparsely settled; and some thought that the limit had been reached of the land that would be irrigated. The demand for irrigated land, hoewver, did not cease and a public sentiment sprang up in favor of the state or federal government undertaking irrigation enterprises that were too large for private capital to engage in. The passage of the Carey Act was the result of this agitation. The law provides that each semi-arid state shall be given such amount of land not to exceed one million acres as it shall cause to be reclaimed, occupied and, in part, cultivated. Many of the most successful irrigation enterprises in the West have been Carey Act projects. The state itself does not reclaim the land but avails itself of the benefit of the law by means of contracts made with construction companies. At the request of the state the federal government segregates the tracts desired; the state then makes a contract with some reliable company to construct the necessary reservoirs and canals; when the work is completed the land is patented to the state and in turn patented to the settler who has complied with

the provisions of the law. The construction company is paid the charge fixed for the water. At all times the enterprise is under the supervision of state authorities and no land is offered for sale unless an ample supply of water is assured. When the land is all disposed of the water users take control of the canals and arrange for their maintenance.

Irrigation Storage Reservoir.

The Carey Act Projects.

Considerable progress has been made toward the securing of the full amount of lands Montana may obtain under the Carey Act. Segregation of lands have been asked for as follows:

	Acres.
List Nos. 1 and 7, near Billings	15,378.11
List Nos. 2, 3, 9 and 11 near Big Timber	22,167.81
List Nos. 5 and 6, near Augusta (Dearborn Project)	36,536.42
List Nos. 8, 12 and 14, near Valier	99,218.64
List No. 10, near Bynum	69,971.32
List No. 13, near Martinsdale	20,334.21
List No. 16, near Sheridan	6,566.22
List No. 21, near Flatwillow	7,768.80
List No. 18, near Lima	7,885.52
List No. 22, near Ericson	20,862.91
List No. 15, near Lavina	5,142.30
Total Acreage	311,832.26

Applications for a large part of this acreage are awaiting the approval of the Department of the Interior at Washington. Of the lists that have

been approved a large area has been fully reclaimed and is either now occupied or is ready for settlers.

The Billings Land and Irrigation Company (Lists 1 and 7) was the first project that was completed. It reclaimed a large tract of fine land on the Billings bench, Yellowstone county, that is now occupied by a highly prosperous farming community. Where a few years ago there was not one farm house are now scores of dwellings on well improved farms. Ten school houses in as many school districts bear evidence to the transformation that has resulted from bringing water upon the land. Twice as many people as now inhabit this project may find there splendid farms.

Irrigating Sugar Beets.

The lands in the Billings project are uncommonly fertile and have the advantages of being located close to railroad shipping points and of being near the growing city of Billings. Prices run from $40 to $65 per acre and the terms are one-fourth cash the balance in ten installments with interest at 6 per cent. Full particulars may be had on application to the Billings Land and Irrigation Company Billings, Montana.

The Big Timber project (Lists 2, 3, 9 and 11) has reclaimed lands on both sides of the Yellowstone river in Sweet Grass county. Big Timber on the Northern Pacific Railway is the shipping point. The northern tract embraces sunny slopes near Big Timber Creek. The whole tract is ready for patent. The entire system of reservoirs and canals is complete except for the laterals that will be dug as settlement is extended. Upon the north side system has been expended for various purposes a total of $350,000. About 2,500 acres are settled, comfortable dwelling houses have been erected on many tracts, much land has been put in culti-

vation and splendid crops have repaid the efforts of the settlers. Lands in this project have not long been ready for occupancy, but the first comers have been so successful that there is no room to doubt that in a few years, after more settlers shall have come in, the Big Timber project will be the home of one of the most prosperous communities in the United States. The lands are adapted for fruit growing as well as farming. As in other Carey Act projects any citizen of the United States, or one who has declared his intention to become a citizen, and is over the age of 21 years may file on lands. He may enter 40 or 80 or 120 or 160 acres, and the fact that he has already used his homestead right does not prevent his taking land under the Carey Act. The easy requirements of the law as to residence and cultivation must, of course, be met. In addition to the Carey Act lands the company owns deeded lands that may be bought without

Breaking Land in Big Timber Project.

restrictions as to cultivation and residence. The price of lands within the project are $55 per acre. Full information concerning these lands may be had on application to the Glass Brothers Land Company, Big Timber, Montana.

The Valier project (Lists 8, 12 and 14) is located near the center of Teton county in the northern part of the state. Several reservoirs impound waters of streams in Maria's river drainage basin. The largest reservoir is Lake Frances, adjacent to the town of Valier, with a capacity of about 170,000 acre feet. About 200 miles of main canals and laterals have been built and preparations are being made to build many additional miles. Already two hundred and sixty settlers have purchased homes within the project; and when these lands are brought into cultivation—from Bynum to Valier and on to Conrad—a succession of fine farms will extend and form together one of the largest bodies of cultivated lands in the state.

About 35,000 acres of Carey Act lands are now ready for settlement and open to entry in the Valier project and the company has for sale many

acres of deeded irrigated land that are not subject to the requirements as to entry and residence, nor restricted as to quantity that may be secured by one person, as are the lands reclaimed under the Carey Act. The deeded lands are held at $50 an acre. The terms upon which a settler may enter a claim for the Carey Act lands in this project are the payment of 50 cents an acre, which goes to the State of Montana, and $40 an acre to the company as payment for the water. The settler has 14 years in which to pay this total of $40.50 per acre as follows: The sum of $3.50 per acre must accompany the application at the time the filing is made; the balance is payable in fourteen equal yearly installments, with interest at 6 per cent per annum on deferred payments.

The lands within the Valier project are very fertile and large crops are raised on all tracts that are in cultivation. A. J. Kemper has raised a crop of barley that yielded over 50 bushels to the acre and on 40 acres 3,760 bushels of oats, an average of 94 bushels to the acre. B. Bockma has raised sugar beets on an experimental patch at the rate of 18 tons to an acre. On 20 acres of irrigated land John Kroeze harvested a crop of oats that averaged 112 bushels to the acre. Threshing of the crops grown in 1911 is going on as these lines are written. The Shelby News says that Samuel Morgan's oats threshed 103 bushels to the acre, and by weight 154 bushels as the weight of a bushel was 48 pounds, the standard weight being 32 pounds.

The Valier project has good railway facilities. The Montana Western Railroad runs directly through the tract and the Great Northern Railway along the eastern border. At Conrad the Montana Western connects with the Shelby and Great Falls branch of the Great Northern over which run from Kansas City to Seattle trains of the Burlington system. Great Falls the largest city of northern Montana and an important railroad center is only 70 miles from the Valier project.

Near the center of this project is Valier, a town beautifully situated on Lake Frances; it is is only an infant in years, but the amount of business transacted daily, the improvements that have been made, and the number and character of business houses and private residences that have been erected would be creditable for a town ten times as old.

Information concerning lands in the Valier project may be had on application to Clinton, Hurtt and Co., Valier, Montana.

The other Carey Act projects are not so far advanced as to have land for sale. Information concerning any of them may be had on application to A. W. Mahon, State Engineer, Helena, Montana.

The names of these uncompleted projects and the locations of the lands that are to be reclaimed are as follows: Dearborn project in Lewis and Clark county; Teton Co-operative Reservoir Company, in Teton and Chouteau counties; Musselshell project, in Musselshell county; Franklin project, in Fergus County; Ruby river project, in Madison and Beaverhead counties; Red Rock project, in Beaverhead county; Flatwillow project, in Fergus county; Little Missouri project, in Custer county.

The Government Reclamation Projects.

The next stage of development of the irrigable lands was their irrigation with water provided by the United States government.

The Government reclamation projects are undertaken under the act of June 17, 1902, known as the National Irrigation Law, which provides that money received from the sales of public lands in certain states and territories, of which Montana is one, shall be used as the reclamation fund for the construction of works necessary to irrigate arid lands and for the disposition of the land and water rights in completed projects, at the pro rata cost of construction, to actual settlers on long term payments and in quantities not exceeding 160 acres to any one person. The fund is a revolving one. As soon as one project is completed and the lands reclaimed

Pryor Creek Canal, Huntley Project.

settled upon, the replenishment of the fund begins from the payments entrymen make and it is added to every year from the same source. Payments may be divided into ten annual installments, without interest, and all money paid in goes into the general fund and is used for other projects.

Following the passage of the act the Secretary of the Interior caused to be surveyed many large tracts of land that he had reason to believe were suitable for reclamation under the terms of the national irrigation law. After investigation of many surveys a selection was made of those considered most desirable, lands were withdrawn, surveys approved, plans drawn, and the consideration of reservoirs and ditches begun. Each undertaking was designated as a Reclamation Project.

The Government Reclamation projects are: The Blackfeet project; the Flathead project; the Fort Peck project; the Huntley project; the

Lower Yellowstone project; the Milk River project; the St. Mary project and the Sun River project.

The Blackfeet project is intended by means of five irrigation systems to reclaim lands on the Blackfeet Indian Reservation in Teton county. The irrigable area of the whole project is 133,000 acres and of the Two Medicine unit, to which the work has been confined, 50,000 acres.

The Flathead project has for its plan the irrigation of about 150,000 acres in various parts of the Flathead Indian Reservation in Missoula, Sanders and Flathead counties, water being taken by simple diversion works from several rivers and creeks rising in the Mission Mountains. The stream flow is conserved by storage in twelve reservoirs and is supplemented by pumping from the Flathead River by water power. Irrigable tracts in Jocko and Mission Valleys and near Polson have been selected for the first development. The irrigable area is 152,000 acres; and in

McDonald Lake—Flathead Project.

1910 the system was sufficiently advanced to supply water for 10,000 acres. Concerning the progress made during the fiscal year 1910 the last report of the Director of the Reclamation service says:

Canals on the Jocko and Mission divisions were completed sufficiently to supply water to some of the lands during the season of 1910. During April and May there was little call for irrigation water, but in the month of June about 1,000 acres of hay and grain in Jocko division and 500 acres in Mission division were irrigated. Many of the crops were, however,

suffering from want of water and have been injured by the delay in beginning irrigation.

Topographic surveys have been extended to cover a total of about 187,000 acres, including reservoir sites, probable canal locations, and most of the irrigable lands east of the Flathead River. Location surveys have been made for canals diverting water from Crow, Big Knife, and Post creeks and for distributing it over about 15,000 acres of land.

On Jocko division during 1909 canals were completed to irrigate about 5,000 acres of land, and during the early part of 1910 canals were finished to supply water to nearly 3,000 acres more. On the Mission division canals were completed in 1909 to irrigate about 5,000 acres of land and the excavation of other canals has been continued during the season of 1910. On Pablo division a steam-shovel outfit has been assembled near Polson and put in operation in the excavation of the 300-second-foot canal to supply Pablo reservoir. This canal will take water from Crow Creek at a distance of about 12 miles and will later be extended 12 miles farther to secure water from Post Creek. On Polson division the sinking of the shaft near the intake end of Newell tunnel, begun in June, 1909, was continued until its completion in December, 1909, when the work of driving the tunnel itself was begun. On June 30, 1910, 480 linear feet of tunnel had been driven through hard limestone, the character of the rock and the use of the hand drills rendering the progress slow. A power-house site has been graded at the west portal of the tunnel. Excavation of canals has also been in progress on this division. On Post division the construction of a canal to water about 10,000 acres of land was begun in April, 1910, and on June 30, 1910, was well advanced.

The Fort Peck project has for its purpose the irrigation of lands within the Fort Peck Indian Reservation in Valley county. The irrigable area of the whole project is 132,000 acres and of the Little Porcupine unit 2,000 acres. Concerning this project the last report of the Director of the Reclamation Service says:

The irrigation plan of Fort Peck project provides, in so far as the water supply is sufficient, for the irrigation of lands in various parts of the Fort Peck Indian Reservation and adjacent thereto, as follows: 8,000 acres in the vicinity of Milk River station, with water supply from Big Porcupine Creek conserved by storage; 2,000 acres in the vicinity of Frazer, with water supply from Little Porcupine Creek conserved by storage; 20,000 acres in the vicinity of Poplar, and extending along Poplar River a distance of about 35 miles, with water supply from Poplar River, conserved by storage at the forks of Poplar River and West Branch; 15,000 acres lying along the west side of Big Muddy Creek with water supply from Big Muddy Creek conserved by storage at the mouth of Wolf Creek; 50,000 acres of clear bench land and approximately 25,000 acres of brush and timber land extending along the Missouri River with water supply from Missouri River by a gravity canal heading near the site of old Fort Peck; and two tracts of 6,000 acres each adjacent to and above the gravity canal that can be irrigated by pumping from the Fort Peck canal with lifts of 12 and 20 feet, respectively. Steam power for the pumping can be developed from coal obtainable on the reservation, large deposits of coal occurring near Brockton on the main line of the Great Northern Railway, and other deposits being known to exist at a number of points on the south side of the Missouri River.

In July, 1908, investigations and surveys of the Fort Peck project were begun by the Reclamation Service and reconnaissance and topographic surveys and investigations of storage sites and power opportunities have been made. In September, 1909, construction work on Little Porcupine unit was begun and on June 30, 1910, was 90 per cent completed.

During the fiscal year topographic surveys of about 97 square miles of irrigable lands along the Missouri River and about 6 square miles along Poplar River, a preliminary location of over 68 miles of canal lines and surveys of the Little Porcupine unit were made. Construction work was begun in September, 1909, upon the Little Porcupine unit. The work involves the construction of a small rock-filled timber-crib dam with concrete superstructure on Little Porcupine Creek, a

Main Canal Sun River Project.

flood canal of 200 second-feet capacity and 6,000 feet long, and a reservoir of 2,000 acre-foot capacity near the town of Frazer with concrete outlet works. The work has been carried on continuously, except for about three months during severe winter weather and is about 90 per cent completed.

The Huntley project in Yellowstone county was the first to be opened to settlement. The Yellowstone river is the source of the water supply and the irrigable area of the whole project is 32,521 acres and of the main unit 28,921 acres. The main unit was completed in 1908 and 96 per cent of the whole project had been completed June 30, 1910.

The Lower Yellowstone project has the Yellowstone river as the source of water spply for the irrigation of lands in Dawson county, Montana, and McKenzie county, North Dakota. The irrigable area of the whole project is 63,780 acres and of the first unit 43,310 acres. Of the whole project 95 per cent was completed June 30, 1910. Some of the lands have been opened for settlement. During the season of 1909 about 5,000

acres of land were irrigated and in 1910 about 7,000 acres. Up to June 30, 1910, according to the last report of the Director of the Reclamation Service, 146 water right applications for the irrigation of 12,897 acres of land had been received. Of the irrigated acres in 1910 about 6,000 were planted in wheat and oats, and about 1,000 in alfalfa, flax, barley, rye and garden vegetables.

The Milk River project should be considered in conjunction with the St. Mary project on which it depends for a large part of its water supply. Together the two form the most costly reclamation enterprise the Government has undertaken in Montana. The lands withdrawn for this project extend from Township 27 N. to Township 33 N., and from Range 17 E. to Range 40 E. The magnitude of the work is shown by the extent of territory that is embraced within the plan of reclamation. The Great Northern Railway follows the Milk River Valley through this part of northern Montana and near the project are the towns of Glasgow, Hinsdale, Saco, Malta, Dodson, Harlem, Chinook, and Havre.

The irrigation plan of the Milk River project provides for the utilization of the water of St. Mary River; the storage of water in a reservoir at Chain Lakes on Milk River about 12 miles northeast of Burnham Mont., and in Nelson reservoir south of Milk River near Malta; the discharge of stored water into Milk River as required; the diversion of water from Milk River by a dam near Chinook into two canals, one on each side of the the river, for the irrigation of lands near Chinook and Harlem, comprising the Chinook division; the diversion of water from Milk River by a dam near Dodson into two canals, one on each side of the river, for the irrigation of lands near Dodson, Malta, Saco and Hinsdale, comprising the Dodson division; and the diversion of water from Milk River by a dam near Vandalia into a canal on the south side of the river, watering lands in the vicinity of Glasgow.

Water from the St. Mary project is necessary for carrying out the scheme for irrigating the Milk River lands. The plan of the St. Mary Project provides for the storage of water in St. Mary Lakes by means of a dam at the outlet of Lower St. Mary Lake and its diversion through a canal 26 miles long, heading at the reservoir and discharging into the north fork of Milk River. The water thus diverted will enter Canada, flow through that country 100 miles or more and then return to the United States. Because of this proposed diversion it became necessary for Canada and the United States to enter into an agreement relating to use of the water of these streams and a treaty on the subject was promulgated May 13, 1910, under the provisions of which no international complications can, it is thought, arise to delay the completion of this great public improvement.

The irrigable area of the whole Milk River project is 255,000 acres, and of the first unit under the Dodson south canal 10,000 acres. On June 30, 1910, of the whole project there was completed 12 per cent and of the Dodson first unit 80 per cent. One unit covering about 10,000 acres is completed and over 2,000 acres acres were under irrigation in 1911, the

water being supplied on a rental basis at the price of $1.00 per acre foot. The land under the constructed canal is divided into 87 farm units of various sizes; 600 acres of the irrigable land belong to the state of Montana; about 2,000 acres are public land and the remainder is in private ownership or has been entered under the reclamation act.

In 1908 the Lower Milk River Water Users' Association was formed; and in 1910 it entered into a contract with the Reclamation Service guaranteeing the payment to the United States of the cost of the irrigation works as assessed by the Secretary of the Interior against the lands of the

Main Canal Lower Yellowstone Project.

shareholders of the association. Notwithstanding this agreement, the conclusion of the treaty with Canada relative to the use of the water of streams that flow across the boundary line, the allotment of a considerable sum from the general reclamation fund and an amount still larger as a result of the passage of the law for the issuance of reclamation certificates—a law that was passed largely through the influence of the Montana delegation in Congress—work on the Milk River project has advanced very little.

The lands in this project are fertile and are near railroad lines. If they were opened to settlement, at reasonable rates, many settlers would quickly occupy them, build up thriving communities, and add to the wealth and population of the state. The development of northern Montana has been retarded by the slow progress of this project; and though few there are who will not admit that many diffculties have arisen to delay the work the general feeling is one of keen disappointment that the Milk River pro-

ject has not got along faster and farther. No probable data for the opening to settlement of any lands within this project can now be given.

The Sun River project has for its object the reclamation of lands in Teton, Lewis and Clark, Chouteau and Cascade counties. The irrigable area of the whole project is about 300,000 acres, and of the Fort Shaw unit 16,000 acres. Of the whole project 7 per cent was completed June 30, 1910. The Director describes the plan of the project in these words:

The irrigation plan of the Sun River project provides for the storage of water in the Warm Springs reservoir on the North Fork of the North Fork of Sun River, in the Willow Creek reservoir on Willow Creek, in Pishkun reservoir north of Sun River and in Benton Lake reservoir, 8 miles north of Great Falls, Mont., the diversion of water from South Fork of North Fork of Sun River through a supply canal into Warm Springs reservoir; the diversion of water from the North Fork of Sun River through supply canals into Willow Creek and Pishkun reservoirs; the diversion of flood waters of Deep Creek into the Benton Lake reservoir; the diversion of water from Bowl Creek, a tributary of Flathead River, on the west side of the Continental Divide through a canal one and one-half miles in length into the North Fork of the North Fork of Sun River; the diversion of waters from Sun River, supplemented by stored water released from Warm Springs and Willow Creek reservoirs, into a canal system watering lands mainly in the abandoned Fort Shaw military reservation; the diversion of water from Pishkun reservoir into a high-line canal supplying water for lands in the Sun River Valley; the diversion of water from Deep Creek, supplemented by stored water released from Pishkun reservoir, and for the lower lands of the system by stored water released from Benton Lake reservoir, into a canal system supplying water to lands in the Sun and Teton valleys.

The Fort Shaw unit was completed December, 1909. The lands reclaimed are in Townships 20 and 21., Ranges 1 to 3 W. According to the last report of the Director of the Reclamation Bureau of the irrigable lands opened 9,535 acres had been entered subject to the reclamation act; 2,743 acres were open to entry; 377 acres were state lands; and 1,984 acres were in private ownership. The Sun River project will bring under irrigation a very large and fertile tract of land in northern Montana near Great Falls, an important railroad, commercial and manufacturing city.

When these great reclamation enterprises shall be completed, they will afford attractive homes for many thousand settlers; but the land seeker of today is chiefly interested in learning of land that may now be entered.

The reclamation projects that have been opened for settlement are the Huntley, the Fort Shaw unit of the Sun River, and the Lower Yellowstone projects.

Most of the 582 farms into which the Huntley project was divided were quickly taken and a very prosperous farming community now occupies the reclaimed lands. Excellent crops are raised and lands have advanced in value. No tract is far from a railroad station and towns and churches and schools are convenient to all settlers. At the end of September, 1911, only about 118 farm units were still open to entry. Water was available for all of them and they embraced some of the best land in the project. Additional works to cover about 4,000 acres are being constructed.

The farms contain from 40 to 160 acres of which 40 to 100 acres are

irrigable. The land office nearest to this project is at Billings, Mont., where filings may be made. No filings except those of veterans will be accepted unless the entryman makes a statement under oath that he has seen the land. When a filing is made on one of these farm units, there is a filing fee of $6.50 for a 40 acre farm and $8 for an 80 acre farm. The price for the water right is $30 per acre payable in 10 annual installments of $3.00 per acre without interest, and $4.00 per acre for land, payable $1.00 at date of entry and 75 cents per acre per annum for 4 years thereafter.

Any citizen who has not exercised his homestead right is entitled to make a homestead entry in any unoccupied farm on the project. The settler is given six months from the time of making entry to establish residence, and before the end of that time he must be actually living on the ground. A title to the land cannot in any case be acquired before the expiration of five years. The commutation clause of the homestead law does not apply in reclamation projects. Under the act of February 8, 1908, a person who, prior to the date, has made and lost one homestead entry, but who is otherwise qualified, may, subject to certain conditions, make a second entry. The law states that second entries will be permitted if the first entry was lost, forfeited, or abandoned, provided the first entry was not canceled for fraud nor abandoned or relinquished for a consideration.

Veterans of the Civil and Spanish wars and the Philippine insurrection are entitled to have the term of their enlistment, not exceeding four years, deducted from the time necessary to prove up on a homestead under the reclamation act. Veterans also have the privilege of filing by proxy.

The total cost to the settler of the irrigated portion of these lands, including maintenance and operation for ten years, will probably be about $40.00 per acre, the deferred payments without interest making the present worth cost only about $25.00 per acre. In regard to these payments it should be also noted that the land is exempt from taxes during the time of payments.

The Fort Shaw unit of the Sun River project, which is now open to settlement, embraces 252 farm units, containing 16,000 acres of irrigable land. Thirty-six of the farm units, covering 2,315 acres, are still open to homestead entry. The price of the water right is $30.00 per acre, payable in 10 installments without interest. The amount of irrigable land per farm unit ranges from 40 to 110 acres.

These farm units were carefully laid off to equalize the value of different farms as nearly as possible, and the intention has been to give in connection with the irrigable area as much pasture land, up to a total of 160 acres, as circumstances would permit.

All the crops that succeed in northern countries can be grown on these lands, but the principal crops will be alfalfa, alfalfa seed, cereals, sugar beets, potatoes and other roots. Alfalfa is cut three times each season and yields about five tons per acre. All small fruits do well in the Sun River Valley.

The lands of the Fort Shaw unit are very desirable. They are near

Dodson Dam, Milk River Project.

the large city of Great Falls and are very fertile. Fort Shaw and Simms are flourishing towns located within the project. Vaughn, on the Great Northern Railroad, is a convenient shipping point; and the probabilities are that within a year or two not less than two railway lines will be built through the productive Sun River Valley.

To June 30, 1910, 162 filings and water right applications on public lands and 4 water right applications for private lands had been received. The water right applications were for 9,686 acres of irrigable land. On October 1, 1911, there were 36 farm units subject to entry.

The Lower Yellowstone project was opened for irrigation by notices dated December 21, 1908 and April 24, 1909. There are about 29 farm units covering 1,460 acres now open to homestead entry under the reclamation act, and there are several thousand acres in private ownership which are held in areas in excess of the 160 acre maximum on which one person may perfect a water right under the reclamation act. The usual size of farms in the Lower Yellowstone project is 80 acres. The building charge is $45.00 per acre for land entered prior to December 1, 1911, payable in graduated payments beginning in 1913, without interest, the operation and maintenance charge being fixed at $1.50 per acre. A few farms are subject to a building charge of $42.50 per acre.

One of the obstacles that has delayed the development of this section will be removed by the completion of a branch line of the Northern Pacific Railroad, on which work has begun. The land is fertile and large crops have been raised on such tracts as have been irrigated. Fruit trees are said to do well. Back from the irrigated lands of the valley are bench lands on which farming without irrigation is being carried on with encouraging results. Savage, Sidney, and Fairview are new and flourishing towns which have sprung up since the development of the farm lands of the Lower Yellowstone Valley began a few years ago.

Information concerning lands in any of the Montana reclamation projects may be had on application to H. N. Savage, Chief Engineer, Helena, Mont. Inquiries about land in the Huntley project may be made to the Project Engineer, Huntley or to the United States Land Office, Billings; about lands in the Lower Yellowstone project to the Project Engineer, Glendive, or to the United States Land Office at Miles City; about lands in the Fort Shaw unit of the Sun River project to the Project Engineer, Fort Shaw or the United States Land Office at Great Falls; and about lands in the Dodson unit of the Milk River project to the Project Engineer, Dodson.

IRRIGATION STATISTICS.

The Census Bureau has issued a preliminary report of irrigation statistics in Montana from which the following extracts are made:

Acreage, Equipment, and Cost.

The total number of farms irrigated in 1909 was 8,970, against 8,043 in 1899, an increase of 927, or 11.5 per cent. Within the same period the number of farms in the state had increased 96.1 per cent, indicating that dry farming had a more rapid growth than irrigation during the 10 years.

The total acreage irrigated in 1909 was 1,679,084 acres, against 951,154 acres in 1899, an increase of 727,930 acres, or 76.5 per cent. During the same period the improved acreage on farms increased 109.6 per cent, indicating again the more rapid advance of dry farming. The area irrigated was 46.1 per cent of the improved land in farm in 1909 and 54.8 per cent in 1899.

The total acreage which all enterprises were capable of irrigating in 1910 was 2,205,155, an excess of 526,071 over the area irrigated in 1909. The acreage included in projects either completed or under construction in 1910 was 3,515,602,

Plowing at Valier.

an excess of 1,836,518 acres over area irrigated in 1909. This indicates the area which will be available within the next few years for the extension of irrigation, and shows that the area irrigated can be more than doubled without the construction of additional works.

The number of independent enterprises reported in 1909 was 5,534. The total length of main ditches in 1909 was 12,990 miles, against 6,812 miles in 1899, an increase of 6,178 miles, or 90.7 per cent. The number of reservoirs reported was 917, having a combined capacity of 579,953 acre-feet. The number of wells pumped for irrigation was 10 and the number of pumping plants 125. The engine capacity of pumping plants was 3,057 horsepower. The acreage irrigated with pumped water was 8,023 acres.

The total cost of irrigation systems reported in 1910 was $22,819,868, against $4,683,073 in 1899, an increase of $18,136,795, or 387.3 per cent. The average cost per acre in 1910 was $10.35, against $4.92 in 1899, an increase of $5.43, or 110.4

per cent. The average cost of operation and maintenance per acre in 1909 was 89 cents, against 28 cents in 1899, an increase of 61 cents, or 217.9 per cent.

Distribution by Type of Enterprise and by Source of Water Supply.

The acreage irrigated in 1909 has been classified according to the state and Federal laws under which the works were built or are operated as follows: United States Reclamation Service (act of Congress, June 17, 1902,) 14,077 acres, or 0.84 per cent of the total; United States Indian Service)various acts of Congress), 67,417 acres, or 4 per cent o fthe total; irrigation districts, 4,912 acres, or 0.3 per cent; cooperative enterprises, 329,426 acres, or 19.6 per cent; commercial 1,191,000 acres, 62,544 acres, or 3.7 per cent; and individual or partnership enterprises, 1,191,060 acres, or 70.9 per cent. Works built by the United States Reclamation Service are to be turned over to the water users for operation and maintenance. Including these 92.3 per cent of the acreage irrigated in 1909 was supplied by works controlled by the water users.

Harvesting at Valier.

Streams supplied 1,632,619 acres, or 97.2 per cent of the total acreage irrigated in 1909; lakes supplied 5,622 acres, or 0.3 per cent; wells supplied 262 acres, or 0.02 per cent; springs supplied 17,967 acres, or 1.1 per cent; and reservoirs supplied 22,614 acres, or 1.3 per cent.

Summary of General Irrigation Data.

Further details can be drawn from the following summary:

	1910	1899	Increase. Number or amount.	Increase. Per cent.
Number of farms in state	26,214	* 13,370	12,844	96.1
Approximate land area of state (acres)	93,568,640	93,568,640	.....	.....
Improved land in farms (acres)	3,640,300	*1,736,701	1,903,608	109.6
Total value of farm land	$226,771,302	*$52,660,560	$174,110,742	330.6
Average value per acre of farm land	62.29	*30.32	31.97	105.4
Number of farms irrigated	** 8,970	8,043	927	11.5
Acreage irrigated	** 1,679,084	951,154	727,930	76.5
Area enterprises were capable of supplying in 1910	2,205,155	†	.....	.....
Area included in projects	3,515,602	†	.....	.....
Per cent of number of farms irrigated	** 34.2	60.2	†† 26.0	†† 43.2
Per cent of total land area irrigated	** 1.8	1.2	0.6	50.0
Per cent of improved land in farms irrigated	** 46.1	54.8	†† 8.7	†† 15.9
Number of independent enterprises	5,534	2,902	2,632	90.7
Total length of ditches (miles)	18,934	†	.....	.....
Length of main ditches (miles)	12,990	6,812	6,178	90.7
Length of lateral ditches (miles)	5,944	†	.....	.....
Number of reservoirs	917	†	.....	.....
Capacity of reservoirs (acre-feet)	579,953	†	.....	.....
Number of flowing wells	15	†	.....	.....
Number of pumped wells	10	†	.....	.....
Number of pumping plants	125	†	.....	.....
Engine capacity of pumping plants (h.p.)	3,067	†	.....	.....
Acreage irrigated with pumped water	** 8,023	†	.....	.....
Acerage irrigated from flowing wells	** 207	†	.....	.....
Total cost of irrigation systems	$22,819,868	$4,683,073	$18,136,795	387.3
Average cost per acre	$10.35	$4.92	$5.43	110.4
Average annual cost of operation and maintenance	** $0.89	$0.28	$0.61	217.9

* In 1900. ** In 1909. † Not reported in 1899. †† Decrease.

These statistics show a gratifying increase in the ten year period of the number of acres under irrigation and the following statement is of special interest:

"The acreage included in projects either completed or under construction in 1910 was 3,515,602 an excess of 1,836,518 acres over area irrigated in 1909. This indicates the area which will be available within the next few years for the extension of irrigation, and shows that the area irrigated can be more than doubled without the construction of additional works."

But these works when completed will furnish water for only 3,515,602 of the 8,000,000 acres of irrigable area. There remain opportunities for large projects under the Carey Act and for companies to provide irrigation systems for large stock ranches that could be more profitably devoted to farming.

The numerous small irrigating canals which were built in early days

Hauling Grain, "Every Farmer Carries a Check Book."

to supply water to small tracts were constructed when labor was difficult to secure, when present day ditch-digging machinery had not been invented, when land was cheap and not in demand, when the services of an irrigation engineer were not available, and when farming was usually an incident to stock raising and there was no inducement to make a ditch carry more water than was needed at that time for the limited farming operations then carried on. Water was brought on lands with less of effort and at a lower cost than in any other state. Conditions have changed; irrigated lands are in demand at a high acreage valuation, though low compared with irrigated lands in other states; and the possibilities of increasing the area that may be irrigated from the sources of water supply for the ditches constructed in early years by building reservoirs to store water which now runs to waste, by improving existing ditches, changing their course and building new ones when necessary, and by putting a stop to the very large percentage of loss of water by seepage in poorly constructed canals receive earnest consideration. Many additional acres may also be irrigated by pumping plants that will lift water from running streams and from wells.

CROP YIELDS ON IRRIGATED LANDS.

Certain settlers on the Huntley project wrote in 1909 of their experiences.

E. Eiker, of Osborn, said:

I settled on the Huntley Project in the Spring of 1908. My first crop was very satisfactory. The second promised very fair, when it was cut down by hail. My crop for 1910 is very fine. I am growing on contract for an Eastern seed firm, the following crops: Garden peas, sweet peas, wax beans, radishes, onions and cantaloupe. Besides, I have alfalfa and blue joint hay, field corn, sweet corn, lima beans and numerous other crops. My alfalfa has already yielded two crops, and at this date—August 8—another is ready to cut. I expect to cut four crops, with a yield of at least 6 tons per acre. Corn promises to make 40 bushels or better, which is good, considering this is not considered a corn country. I am convinced that this is destined to become one of the best farming and dairy communities in the Northwest. The price of butter fat has not been below 30 cents.

I consider my farm worth at least $125 per acre and would not consider any offer for any less. I dot not care to sell at any price. Any man with ordinary "horse sense" and a reasonable amount of industry and thrift can make good here. We have an abundance of water and the system of delivery to the farm units is faultless. The maintenance charges are more reasonable than on most private irrigation projects. The land before the water was put on was practically worthless.

B. H. Simon, of Ballantine, said:

My previous residence was Washington, D. C., being employed in the Bureau of Printing and Engraving as a plate printer. I had about $900 when I first landed in Huntley. I arrived here about the 10th of May and was impressed with the warm weather, as compared with the East, as I always had an idea Montana was such a cold place, although the seasons here are much shorter than in the East.

It costs about $3.50 per acre to break sod, about 80 cents to disk, $1.50 to harrow and level, and $1.50 to pick sage brush, which compares very favorably with any new country. The cost of irrigation depends upon the crop, grain being irrigated about three times, and five acres being about what a man can irrigate in one day until the ground gets leveled up, and I figure it takes a man and team one day getting the ditches in shape, which makes an average of $2 per acre. The crops are surer respecting drouth, but of course the farmer runs the same chance of frost or hail as in any other country.

The way the country is settling up and the fact that each man has only 40 acres, there will be more social life here than in the average farm community where houses are sometimes miles apart. $1,000 is the least amount a newcomer should have, though there are men here who have come in with a couple of hundred and who are not in debt today. A practical farmer with tools and horses does not need that much, but has to have enough to build shelter for himself and stock. A knowledge of farming is not absolutely essential, though the city man must expect to pay for his knowledge, as one does not get anything for nothing. I don't mean he has to pay anyone money, but his experience will cost him money. There have been several talks of cooperation in the selling of crops, but as there have been so many different crops grown, there has been no special crop to sell.

Sugar beets seem at present to head the list and the Sugar Beet Company has made every effort to take care of all the beets grown, which, besides finding a ready sale, are fine feed for cows and pigs.

Every effort is being made to have schools to educate the children of the farmers, although a High School is not yet established on the project, there being few children of sufficient age to attend such, and it is expected that a High School will be only a matter of a couple of years. The county is making an effort to grade the roads, and as there is not much rain, those that are graded are in fairly good shape. As there is plenty of gravel in the river, and the roads all being within a couple of miles of the river, there is no reason why we should not have as good roads as any community in the country.

Settlers on the Sun River project wrote the following letters in October, 1909:

A Field of Alfalfa.

W. H. Tallman of Simms, says:

We came here in the spring of the present year locating on the Fort Shaw unit of the Sun River project. We were late getting started and did not get our crops in until June, but with all that, our crops grown on sod were all good, our wheat making from 20 to 40 bushels per acre; oats from 30 to 40 and vegetables were all as fine as I have ever seen grown in any country.

Everything is in fine shape at the present. We had our first killing frost on the night of October 5th. There is a good deal of fall wheat sown here and it is up and looking fine. I do not think there is a finer chance anywhere for the newcomer to succeed than in the Sun River Valley and the country surrounding. The soil is excellent and the water fine and very healthy. There are lots of fish in the river, plenty of small game in the valley and big game in the mountains just west of us. Taking it all around I do not think that the man that locates here will make any mistake. There is still a good deal of Government land open to homestead.

W. J. Ranton of Fort Shaw, wrote in October, 1909:

The average yield of oats was 40 bushels per acre on sod ground broken this spring. The spring being very backward and cold, the crops were not in until very late, oats not sown until the 9th of May. Wheat yield averaged 35 bushels per acre, wheat not sown until May 18th, which was very late for wheat. Millet sown June 21st cut one and a half tons per acre. Potatoes planted on sod yield-

ed 200 bushels per acre. Beans planted June 2nd threshed 700 pounds per acre. Vegetables of all kinds have done exceptionally well on sod broken this spring. I have no reason to disbelieve that 80 to 100 bushels of oats could be raised on the same ground next year, and other grains do as well in proportion.

My opinion is that a farmer in this section of the country can make money on any of the land in this section of the country tributary to the Great Northern Railroad. Any kind of grain and vegetables can be grown here in abundance. There are many farmers here this year who have no knowledge of farming before who have raised good crops this year under very unfavorable circumstances, as they came here late in the spring and got their crops in late. Many people scorned the idea of raising beans here but we have proven to them that such can be done, also field corn, as we have some ripe, which was not planted until June 2nd. In regard to early frosts, potatoes in this section of the country are still green and untouched by frosts. While we have had very slight frosts here the last month it has not damaged anything. Yesterday we picked some cucumbers from vines in the garden. I have lived in Canada, in fact was raised there, and the growing season is longer in Montana than in Canada and there is more warm weather, the danger of frosts less and the winters milder.

Settlers on the Lower Yellowstone project related their experiences in letters written in 1909:

Marius Anderson said:

I came to this country from Denmark about eight years ago. At the time of my arrival in the Lower Yellowstone Valley I had only $15 in money, with a wife and two children to support. I took up a homestead and made my living thereon until I made final proof. I then sold the land for $2,000 and bought my present home for $4,000. Since purchasing this land about three years ago I have put on $3,300 worth of improvements and have horses and cattle on the place worth $2,200, as well as all the necessary farm equipment. I value my farm of 160 acres and other holdings at from $8,000 to $10,000. I plan to sell half my farm, believing I can make as much on 80 acres well farmed as on 160 acres. This is the first year I handled water and I can do better next year. Fifty acres of wheat yielded 1,300 bushels. A second fifty not so well watered yielded only 965 bushels. Fourteen acres of oats yielded 725 bushels, and one-third of an acre of potatoes yielded 80 bushels, or at the rate of 240 bushels per acre. Nine acres of alfalfa were started and 32 tons of hay produced the first season.

O. J. Kvarsten said:

In the fall of 1906 I came to Montana from the old country and settled on 80 acres. I put up a log building and bought two wagons, two teams with harnesses and a cow, paying $575.00. I now have 13 head of cattle, 8 head of horses, 30 hogs, poultry and etc., and own my farm implements. I have enlarged my home and built a hen-house, barn and granary. I am free from debt and have this year's crop to dispose of. This consists of 651 bushels of wheat raised on 21 acres, 1,000 bushels of oats from 18 acres, 62 bushels of barley from 3 acres, and 160 bushels of potatoes from half an acre of land. With better experience I expect to have better returns from my crops next year. I would not sell my place, equipment, stock and grain for less than $5,000.

$4,627.50 From 160 Acres.

Prof. Alfred Atkinson of the Montana Agricultural College in speaking of irrigated farming in Montana says:

"To the uninitiated, farming under a system of irrigation appears complicated and expensive. He may appreciate the fact that returns are high, but he is afraid that the worry and expense connected with the irrigation is such that it would be an undesirable branch of agriculture to take up. The returns on irri-

gated farms are such as to make the bare statements of facts concerning them appear like an exaggeration to the unfamiliar ones. If a western man tells his eastern friends about the crop yields he has gained he is usually made an object of pity because he has so far forgotten hish early training that he makes what appears to his friends wholly unwarranted statements. Presentation of a few figures showing the returns from one farm in Montana may serve to show something of the possibilities of an irrigated farm. These returns were gained under the ordinary methods, and while they are good, yet they are not extraordinary, and many other instances could be cited which show returns equally as good. The farm in question contained 160 acres and was divided as follows: Thirty acres in wheat, thirty acres in oats, eighty acres in clover and twenty acres in pasture, potatoes, etc. The thirty acres of wheat gave a yield of eighty-three bushels to the acre, which, figured at seventy-five cents a bushels, shows a gross return of $1,867.50. The thirty acres of oats yielded 100 bushels to the acre, which, when figured at 40 cents a bushel, shows a return of $1,200. The cutting of clover gave a yield of two tons to the acre, or 160 tons, which sold at $6 a ton, making $960. The second crop of clover was sold on the ground for pasture for $200. From the twenty acres devoted to pasture, potatoes, etc., $400 was gained. These different returns taken together make a total of $4,627.50 from 160 acres of average Montana land under irrigation. My reader from the humid sections will be asking concerning the cost of irrigation. While these results may be possible, is not the outlay for irrigation such as to take a large share of the returns? A recent Bulletin published by the Department of Agriculture on the subject of 'Irrigation in Montana' shows the average cost of irrigation on the different crops. The figures are based on the actual cost to a large number of representative farmers, and show that $1.07 per acre will cover the cost of irrigation on the ordinary field crops. This would make irrigation on a 160 acre farm cost less than $200, which is a true statement, as the sum would very fully cover all the expense for maintaining the ditches, putting in the laterals, and hiring irrigators to spread the water over the ground."

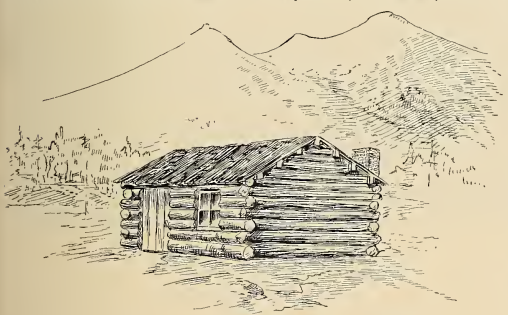
Farming Pays.

LIFE ON A MONTANA FARM.

R. N. Sutherlin of Great Falls, who in the columns of the Rocky Mountain Husbandman and in public addresses has for a generation been most earnestly advocating the extension of irrigation and the development of the state's agricultural resources has drawn in the words that follow a true and vivid picture of life on the Montana farm:

(From the Rocky Mountain Husbandman.)

During the years this publication has been going forth to cheer and encourage its readers, we have said many cheerful things about this land of our adoption in early life and of late we have been reviewing these things in our mind to somehow see if we were fully justified in all that we have said, and while we are frank enough to admit that we may have at times used a little poetic license in our descriptions, we really believe that all we have said has been justified by existing facts. We, in fact, know of no country with a more delightful run of seasons. We apple blossoms of spring, with their beautiful red and white and a delicate perfume, literally fill some of our mountain valleys. Then from June 15th to September 15th the traveler along our country roads has one continuous delight of perfume of new mown hay. The delightful perfume, wafted on the wing of the mountain breeze, floats in at the open window of the country home in this land of elysium. What could make the rest of th haymaker, toil worn, more delightful and restful?



A Home in 1864.

can conceive of nothing more beautiful than the Montana springtime, and when the unfolding robes of green, everywhere beautiful to behold, and the spring merges into June, the greenest and gest growing month in the year, there are the waving fields of clover, the purpling of alfalfa and the perfume of new mown hay. The landscape browns in July and August, but the valley land where the waters flow are beautiful and delightful until the summer is gone. Have you not stood on an eminence in Montana and looked out over some of her valleys in mid-summer and admired the green and the brown and followed up the heights with eye to the dark timber line? Hundreds of times have we expatiated over the thrilling grandeur of the Montana landscape. And then, when summer is gone, the hay piled into big ricks and the grain is in stacks or is threshed and is in the bin and the "sear and yellow leaf" is here, we have another picture for the lover of delightful things to rave over. From the dear old town of White Sulphur Springs we have looked across the valley of Smith River and marked the golden stripes of willow and aspen coming down the sides of the distant mountains, ever and

anon throughout the length of the valley, thirty or forty miles at least, and that was but one of a hundred of Montana's delightful valleys. Then it is that you realize the marvelous country, the orchards bending with fruit, the bins bursting with grain, and hay piled up by the thousands of tons everywhere; and who could ask for a more delightful home? First, we have the budding spring, with its gorgeous apple blossoms and soft and velvety foliage of the unfolding leaves, then come the green fields and pretty daises, the luscious, succulent vegetables, followed by the small fruit, first the domestic, and later the wild fruit. No country has a longer fruit and more tender vegetable season, and the ever luxuriant pasturage and cows ever wading knee deep in clover guaranteeing cream and butter and milk and buttermilk. Then there is the continual harvest of eggs and in midsummer the spring chickens, and as the sear and yellow leaf of autumn comes on apace, there is the honey the bees have gathered from the alfalfa fields, and the farmer simply lives like a king until Jack Frost begins to pinch, which ushers in the season of roast turkeys, roast geese, roast duck, or roast pork, or spare ribs and sausage, the chief feast season of the year, which lasts up to the dawning in of the new year. And Montana's beautiful autumnal days, when the sun's

A Home in 1911.

rays strike the earth's surface askance and cloudless skies make every heart swell with joy and every pulse beat with pride that the sunniest clime on earth is their portion. So gay is the summer and so wonderful the autumn that when the boreal blasts do come shrieking and howling through bending branches of the trees and about the eaves of the dwelling that the reflection that his store houses are full and that he has abundant for man and beast is such a satisfaction, and the long winter evenings afford such a grand opportunity for reading and studying life's problems that the winter hurries rapidly by and spring is here again ere the farmer is aware of it. We do not believe there is another country on earth where the entire year is a more perfect charm. Certainly it is not the land where the skies turn gray and vegetation becomes loaded with dust or where the sunny side of the house is at a premium in winter. Montana makes no pretensions to wintering without artificial heat. We build our habitations so that the minimum amount of fuel suffices to keep them perfectly comfortable, and when the winter is on we put on warm clothing and our people, being prepared for whatever may come, go through life as comfortable as any people on earth. Our soil is productive, our

climate exhilarating, the water is fine, the air pure and develops a wonderful lung capacity. The difference between the inhalation and the exhalation is greater than elsewhere on the continent, and there is a reasonable assurance of wealth, health and happiness. We know of no better place and we believe Montana is today the home of the happiest rural people on earth. This picture is not overdrawn, is not colored beyond or even up to nature itself, as we see it every day, and we beg of our readers who think differently to come and reason with us and see if the claim we set up in these columns thirty-five years ago are not true, and if conditions do not warrant even a more elaborate story than we have told. It is

A Typical Farm Scene.

written that "all men are liars" and that men enunciate falsehood sometimes so frequently that they get to believe it themselves. But we do not think this is the case with us in regard to this wonderful mountain land. Hundreds of old time settlers have amassed a competency in this land during the years we have been discussing the country home in these columns and thousands of contented, happy men and delightful lovely women grasp us by the hand wherever we go and assure us that the story the Rocky Mountain Husbandman tells is not a romance, but a fully verified truth.

UNIRRIGATED FARM LANDS.

Natural Precipitation Sufficient in Some Districts—Conservation of moisture Required in Others—Reasons for Montana's Superiority—Results at Experiment Stations—Profits.

The unirrigated farm lands of Montana are all lands that are now farmed, or that may be farmed, successfully without irrigation. They include : (1) Lands where the natural precipitation is sufficient to produce crops without either irrigation or the conservation of moisture by the dry farming system of cultivation; and (2) lands on prairies, benches and uplands where it is advisable or necessary for the profitable production of crops to cultivate the land by methods known as scientific dry land farming.

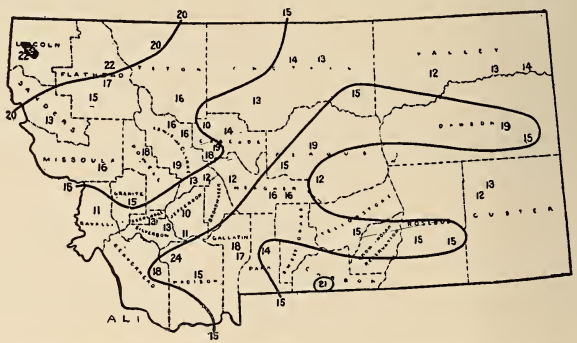


FIG. 11.—Rainfall map of Montana. The figures show the average annual rainfall in inches From Bulletin No. 188, Bureau of Plant Industry, U. S. Dept. of Agriculture.

The limits of the lands of the first class have not been established. The largest area in the state that for a period extending over a number of years has been cropped without being irrigated or cultivated by dry farming methods is probably in Flathead county. The rainfall is greater the western than in the eastern part of the state and there are many neighborhoods on the west side where in ordinary years good yields will be made on non-irrigated lands although the dry farming practice has not been followed. On the east side also are a great many acres that fall within this class. Some of them have been cropped for many years with almost unvarying success. However, as few parts of the United States do not suffer from an occasional or frequent drought, the injury from which might be very much lessened if the value of conserving the moisture were appreciated,

the prudent tiller of unirrigated land may always find it to his advantage to follow the system of dry farming practice recommended by the Montana Agricultural Experiment Station. Seldom is there an excess of moisture; and crops on land properly cultivated will be saved in dry years and in other years the yields will be increased. "You cannot tell me how to farm" said an old man near Forsyth, "I have farmed 40 years in Wisconsin." His crop of wheat yielded ten bushels, and that of the experiment station close by over thirty bushels, to the acre. Montana lands need to be farmed in accordance with the methods of cultivation that have been found by experience to be adapted to the soil and climate of

Dry Land Hulless Barley.

the state. The farmer of irrigated or of unirrigated ladns if he wishes to win success must follow approved methods of cultivation.

"Dry Farming" is an unsatisfactory term that has come into use, in the absence of a better name, to describe the methods of farming by which crops are successfully grown in semi-arid regions as the result of conserving the moisture that is naturally precipitated. Dry farming is not an absolute but is a relative term that is used in contrast to semi-humid or humid farming, and is applied to the farming of lands where the annual precipitation is less than twenty inches. Below twenty inches of rainfall the larger the precipitation the larger is the success, as a rule; and as the point of no rainfall is approached production diminishes until it finally ceases. The expression "farming above the ditch" also conveys the idea of what is meant to those who are familiar with irrigated sections.

In the history of the origin and progress of dry land farming, a science whose development will be of almost unmeasurable benefit to the world, the name of Mr. H. W. Campbell of Nebraska is conspicuous, and he and others have worked out a system of cultivation by means of which millions of acres of lands in regions of low rainfall that were supposed to be of no agricultural value may be profitably cropped. Conspicuous contributions to the advancement of this science have been made by Director Linfield,

Prof. Atkinson, and their associates of the Montana Agricultural College, by Prof. Thomas Shaw who has had charge of the experiment farms of the Great Northern Railway company, by Dr. W. X. Sudduth, of Broadview, whose experiments have led to a better comprehension of the wonderful value of alfalfa, and by many farmers, one of whom N. E. Holden, of Dillon, has been remarkedly successful with potatoes. This scientific method of cultivation has been adopted in parts of India, Australia, Argentina and the United States. By means of it crops have been grown, in Oregon and in Utah for instance, where the rainfall is lower than any Montana weather station records. In Montana dry land farming is a term loosely applied to all cultivation of non-irrigated land. Certain counties repudiate the expression as not applicable to their condition. Montana, indeed, seems to be in a class by itself.

The Department of Agriculture has recently issued a valuable bulletin upon cultivation methods and rotation of crops in the dry farming section. There are reports from stations in North Dakota, South Dakota, Nebraska, Colorado, Kansas, Texas and Montana.

The different methods of cultivation and different systems of crop rotations cause variations of yield, but the striking fact that all the tables demonstrate is the superior productiveness of the Montana farm.

Of wheat at the Dickinson, North Dakota, station the yields in 1909 in bushels were 24.3, 17.7, and 35.7; at the Bellefourche, South Dakota, station, 23.8, 23.3 and 32.2; at the North Platte, Nebraska, station, 24.5, 26.0 and 31.8; at the Akron, Colorado, station, 14.3, 10.3 and 18.5, and at the Garden City, Kansas, station, 2.1. At the Judith Basin, Montana, station, the yields were 33.0, 33.4 and 34.0 bushels.

Of oats, yields of 75.3, 66.2 and 78.7 bushels are reported from the Montana station against a maximum of 66.6 from all other stations, the average being 30.16, 30.5 and 44.11. Of barley the average yields of all stations were 21.11, 22.88 and 30.74. At the Judith Basin station, Montana, the average yields were 45.2, 43.3 and 49.4 bushels.

The average precipitation for 1910 for the whole state was 15.99 inches which was 1.71 inches below the normal of 17.70 inches. The average rainfall of the whole state, therefore, is nearly great enough to remove it from the list of dry farming states, and the abundance of native grasses and the profusion of crops that grow point to the fact that Montana has some advantages greater than are indicated by the bare statement of the annual precipitation. In Montana dry land farming is understood to mean tillage with from ten to eighteen inches of annual rainfall.

"There is another peculiarity of Montana rainfall," says Director Linfield of the Montana Experiment Station, "that is interesting and of special importance to the dry land farmer. On the coast the season of greatest rainfall is during the winter season, the lighter rainfall coming in months of June, July and August. East of the Cascades, though the rainfall is less, the winter and spring are also the wettest seasons and the summer and early fall are dry. Coming now east of the Rocky Mountains we find the maximum rainfall comes during the late spring and early summer

months. In a measure, the rainfall of this region is complementary to that of the coast. The importance of this fact agriculturally and to our dry farm work is that the season of maximum rainfall is at the season of the year when it is of the greatest value for the growth of crops, viz., April, May, June and July. During these months we get nearly as much rainfall as in the humid districts of the East."

The following table supports Mr. Linfield's conclusions:

PRECIPITATION RECORDS—1905 TO 1910 INCLUSIVE.

Station.	County.	Mean Annual.	Mean during growing seasons. By months. April	May	June	July	Total.	Percentage of annual.
Bozeman	Gallatin	19.05	1.34	1.19	4.19	2.79	9.51	49.9
Billings	Yellowstone	14.28	1.44	3.34	2.02	0.93	7.73	54.1
Chinook	Chouteau	11.11	0.14	2.13	3.49	1.38	7.14	64.3
Dillon	Beaverhead	19.16	1.20	4.30	3.05	1.60	10.15	52.9
Fallon	Custer	11.22	0.44	2.73	3.14	1.31	7.62	67.9
Forsyth	Rosebud	13.70	1.06	2.82	2.87	1.10	7.79	56.9
Glendive	Dawson	14.65	0.85	2.95	3.42	1.71	8.93	60.9
Great Falls	Cascade	19.07	1.05	2.83	5.05	1.81	10.74	56.3
Havre	Chouteau	11.79	0.56	2.05	3.06	1.30	6.37	59.1
Helena	Lewis and Clark	14.03	0.74	2.69	3.28	1.06	7.77	55.4
Miles City	Custer	15.21	0.98	3.15	3.25	1.81	9.19	60.4
Utica	Fergus	17.55	0.70	3.40	3.89	2.34	10.33	58.8

Dry Land Corn.

The timeliness of the rainfall is one reason; another is pointed out in the valuable bulletin entitled "Dry Farming in Relation to Rainfall and Evaporation." (U. S. Department of Agriculture, Bureau of Plant Industry, Bulletin No. 288), which contains a discussion of dry farming in relation to the amount and character of the rainfall and evaporation in the western United States. Among many interesting statements the following may be found:

"Usually in discussing dry farming conditions the annual precipitation is the only feature of the rainfall that receives attention. But there are other factors in connection with the rainfall that have much to do with the successful production of crops. The seasonal distribution of the rain, the rate at which the rain falls, and

the amount of rain that is lost through run-off from the surface all have an important part in determining the percentage of the total rainfall that is really available for the use of crops. Finally, the amount of evaporation which takes place during the growing season determines to some extent the amount of rain that is needed to produce a crop, and this varies greatly in different localities. Prospective settlers in these regions are apt to give very little attention to climatic features other than the total rainfall. They often do not even assure themselves that the figures given for a region represent the normal rainfall and not simply the rainfall for a single year. They ignore almost completely the seasonable distribution of the rain, the frequency of torrential rains, the loss of water through surface run-off, the occurence of hail, and the amount of evaporation."

Why the dry farm lands of Montana are more productive than other lands within the dry farming belt of other states where the precipitation is similar is explained in the bulletin as follows:

"Dr. H. L. Shantz, of the Bureau of Plant Industry, finds that the distribution of a native grass is a good index of the rainfall required in different sections of the Great Plains. Short grass, which consists chiefly of buffalo grass and grama grass, is well suited for this purpose, since it occurs from Montana to Texas. In each section the grass grows as far west as the opposing influences of rainfall and evaporation will permit. Its growth to the east is checked by competition with the prairie grasses. Thus we have a strip of short grass extending from Montana to Texas, limited on the west side by drought and on the east side by competition with other grasses. Therefore the increase in the annual rainfall as we go from north to south in the short grass region represents the additional amount of rain needed to offset the increased evaporation. In Montana, short grass unmixed with other grasses occurs in districts having an annual rainfall of approximately 14 inches; in Colorado, in regions having a rainfall of 17 inches; and in the Panhandle of Texas, in regions having an annual rainfall of 21 inches.

"The same type of native grass requires in Texas 7 inches more of rain a year than in Montana. This gives us at once a measure of the additional amount of rain required for a grain crop in Texas as compared with Montana. Furthermore, the evaporation in Texas during the six summer months exceeds that in Montana by about 20 inches. Therefore, if the summer evaporation at one place in the Great Plains exceeds that at another by 3 inches a corresponding increase in the summer rainfall of approximately 1 inch at the first place is needed to offset the increased evaporation. A rainfall of 21 inches in the Panhandle of Texas is really therefore no better for growing crops than 15 inches in Montana or Dakota, owing to the greatly increased evaporation on the Texas plains."

It is the opinion of many men who have observed the effects of settlement and cultivation in other western states that the turning of the soil and the cultivation of large areas that had previously been devoted to grazing—followed as they are likely to be by the planting of trees—will cause a permanent increase in the annual amount of moisture. Mr. Frank N. Meyer, agricultural explorer of the United States Department of Agriculture has stated his views on this subject in a letter to Mr. Haynes, of the Chicago, Milwaukee and Puget Sound Railway. Mr. Meyer says:

"1. The surface of the soil is stirred by cultivation, the contact of the lower layers of soil with the evaporating crust broken therewith, the moisture of such layers prevented thereby to escape into the air, and is therefore restrained and reserved for the growing of crops.

"2. Wells being dug, and water from lower strata being pumped on the land or brought from neighboring mountain streams, or lakes, slowly increases the total amount of water in the soil, and even in the air. (Note: Riverside in Southern California, formerly sought by sufferers from pulmonary trouble for its

dry air, before orange growing and subsequent irrigation was inaugurated on such a large scale as nowadays, is shunned today by the same class of sufferers on account of its having air which has become heavier and moister, especially at night time, and growers there also note that water is much nearer the surface than in former years, and that less water is needed for irrigation than formerly.)

"3. Large areas being sown to green crops and trees in groups or orchards, absorb a great deal of the heat of the sun, thereby sending up relatively cool currents of air which attract possible rain clouds and force them to precipitate at least part of their surplus moisture. On the other hand, barren or uncultivated lands with a baked surface send up strongly heated currents of air, which dispel and absorb any moisture bearing cloud.

"4. The cool nights, experienced in most arid and semi-arid regions, bring, in the form of heavy dews, a great deal of moisture back to the land again,

Dry Land Alfalfa.

that has been evaporated in the hot day time by crops and trees. (Note: I may mention, as a proof of this, the well known fact that in several sections of the western United Staes, before cultivation and settlement had commenced, dews were exceedingly rare or unknown, while later on, as large areas of land were brought under cultivation, heavy dews became of frequent occurence, and are adding much to the vigorous growth of crops. As the precipitation of water, caused by dews, is exceedingly difficult to measure, the general tendency is to ignore such precipitation, though every cultivator knows that the effect of a heavy dew is almost as beneficial to his plants as a light irrigation."

Many men gathered crops from non-irrigated land in Montana before the new science of dry land farming was heard of. Perry J. Moore, of Two Dot, Meagher county, is a pioneer livestock man who in 1875 drove through the Judith Basin and observed a place where eastern corn dropped by freighters had taken root, sprung up, and grown in some instances as high as six feet. Mr. Moore was convinced that not only corn but grains and vegetables would thrive on unirrigated land. Once his irrigation ditches ran dry yet his oat crop yielded thirty bushels to the acre. "That convinced me" Mr. Moore has said "that while the irrigation ditch with water in it is a good thing to have around a ranch it is not an absolute necessity.

I am convinced that scientific farming means a new era of prosperity to Montana. Some will fail, of course, but a man who knows nothing about ranching might take the best watered place in Montana and lose out."

The importance of demonstrating the value for farming of lands on benches and prairies, lands "above the ditch," on which it is either physically or economically impossible to bring water for irrigation has been recognized by the authorities of the state. The notion that the farm lands of Montana did not extend beyond irrigable areas has been proven unfounded by the experiments the Montana Agricultural Experiment Station has conducted and by the experiences of farmers who have settled on bench lands and have plowed, planted, and reaped crops that surpass those

Dry Land Potatoes.

grown on lands in older states that cannot be bought for less than $100 an acre.

An unirrigated farm is preferred by many to an irrigated one, and each has its advantages as Prof. Atkinson set forth in the remarks that have been quoted wherein he compares unirrigated and irrigated farms. The greater part of the arable raw lands of the state are destined to become unirrigated farms that will produce abundant crops when cultivated by the scientific methods of dry land farming. The man who succeeds on a Montana farm is the man who knows how to farm under Montana conditions; and the "knows how" farmer is the "scientific" farmer, both expressions having substantially the same meaning.

President Worst of the North Dakota Agricultural College is of the opinion that Montana is favored because it has a light rainfall and a dry climate: In an address he said:

"Montana is especially fortunate in having what is called a dry climate. It makes the farmer cultivate his land properly and by being forced to do that, he gets the maximum of results. But there is a larger reason why Montana is fortunate with a light rainfall, or what might be termed a minimum rainfall.

"In those states where there is a large precipitation, the valuable land is always damaged to an extent by the soil being washed off in the freshets. Much of the fertility is lost by this washing. Here, there is nothing of that character to take the nutritive elements from the soil, those elements on which the plant life thrives.

"In Montana, if the farmer cultivates his land properly, he will get a profitable yield about 99 times out of a 100. But in those where the precipitation is very heavy, the crop is often damaged by rains, its cultivation is hindered at a time when it is most needed, and later, when the grain is developing, a sweeping rain storm often results in heavy loss to the crop. So when all these things are considered, Montana farmers have much to be thankful for, that they are blessed with a chance for 'dry farming.'"

Investigations to test the farming possibilities of the non-irrigated lands and to determine what crops and what methods of cultivation would give

Unirrigated Wheat Field on Sun River Bench.

best results were started in 1905 by the Montana Agricultural Experiment Station. In this great work the State, the United States Government, the railroads, and public spirited citizens have cooperated. Several demonstration farms or sub-experiment stations were established five years ago and their number has grown to fourteen. These demonstration farms are in widely separated parts of the state, are located on lands typical of large areas that have not been cultivated, and the results achieved show what other land in the same neighborhood, where conditions of soil and climtae are similar, will produce when properly cultivated.

The Montana Agricultural Experiment Station is at Bozeman and there are sub-stations or demonstration farms in the following counties: Beaverhead, Lewis and Clark, Cascade, Chouteau, Fergus, Meagher, Park, Musselshell, Yellowstone, Rosebud, Custer (3) and Dawson. Bulletin No. 83 "Dry Farming Investigations in Montana" summarizes the results of six seasons' experiments; and Circular No. 3 "Dry Farming Practice in Montana" gives practical advice on farming without irrigation that should be in the possession of every one who farms unirrigated land. Both pamphlets may be had on application to the Director of the Montana Agricultural Experiment Station at Bozeman, F. B. Linfield, who has charge of this work; and the pamphlet "Dry Farming Practice in Montana" may

be had, free of charge, on application to the Commissioner of the Bureau of Agriculture, Helena, Mont.

In Bulletin 74 of the Montana Experiment Station, Prof. Alfred Atkinson explained the plan of the experiment work. He says:

"The aim in taking up this line of experimentation was not to test all of the different crops and soil culture methods that might be proposed but rather by using a few of the most promising crops handled in the best known manner, to determine if crop returns were possible on the non-irrigated lands of Montana. This accounts for the fact that results are reported along but few lines at this time. These few results, however, furnish an answer to the general question by indicating that profitable crops can be raised on the level lands of Montana without the aid of irrigation. The plats on which the tests were conducted were one-half acre in size. In all the grain tests excepting those destined to test different methods of planting, the grain was planted with an ordinary press disc drill. Spring sown crops were planted as early as the ground was in condition in the

Dry Land Oats.

spring, while fall sown crops were planted during the last half of August or the first ten days of September in almost all cases. Outside of the crops grown on new breaking and the continuous cropping tests, all grain was planted on ground that was summer fallowed the year previous. In the variety and rates of seeding tests, the yields reported are from crops grown under the system of alternate grain and fallow. The crops were harvested with the binder and all threshing was done with an Ellis Keystone thresher, with a 24-inch cylinder, driven by a 6-horsepower gasoline engine."

The first table, from Bulletin 74, summarizes the results obtained at the experiment stations up to 1908, and the other tables, from Bulletin 83, by Alfred Atkinson, agronomist, and J. B. Nelson, superintendent of dry farm stations, contains the results up to and including 1910.

YIELDS OF DIFFERENT KINDS OF GRAIN—AVERAGE RESULTS FROM ALL STATIONS FOR ALL YEARS TESTED.

(From Bulletin 74 of the Montana Agricultural Experiment Station.)

CROP.	VARIETY.	Period of Growth—Days.	BUSHELS PER ACRE.						
			Dawson County.	Rosebud County.	Yellowstone County.	Cascade County.	Chouteau County.	Total.	Average.
Fall wheat	Turkey Red	320	36.63	50.41	29.03	.....	35.02	150.82	37.71
" "	Lofthouse	320	28.80	41.95	25.97	.....	.....	96.72	32.24
" "	Gold Coin	321	34.60	46.63	30.63	.....	.....	111.85	37.28
Fall rye	Common	328	32.50	31.82	34.11	.....	15.43	113.86	28.47
Spring wheat	Kubanka	100	17.57	20.80	19.32	12.83	21.40	91.92	18.38
" "	Ghirka	109	.....	.....	.....	16.93	.....	16.93	16.93
" "	Glyndon	109	.....	.....	.....	12.77	.....	12.77	12.77
Barley	White Hulless	95	20.90	28.31	12.33	15.57	11.95	89.06	17.81
"	California	97	22.85	34.38	11.67	12.08	13.71	94.69	18 24
Oats	Sixty Day	98	51.00	40.03	47.94	21.75	27.06	187.78	37.56
"	Canadian White	99	46.25	.....	19.88	20.00	40.38	126.51	31.63
Flax	Common	105	14.06	13.09	2.04	10.29	8.56	48.04	12.01
Grasses	Brome	81	.....	1.40	1.00	.....	.....	2.40	1.20
"	Tall Oat	75	.....	1.08	1.00	.....	.....	2.08	1.04
Alfalfa	Common	....	.....	.....	.67	1.26	.....	1.92	.97
Potatoes	Mill's Prize	151	147.56	160.76	98.43	.....	88.78	495.47	123.87
Sugar beets	Kleinwanzlebener	184	.....	*6.28	*7.00	.....	.....	*13.28	*6.64
Corn for fodder	Western Dent	....	.....	*4.44	*2.90	.....	.....	*7.34	*3.67

*Tons.

FALL WHEAT TESTS.

(From Bulletin 83 of the Montana Agricultural Experiment Station.)

STATION.	VARIETY.	1907		1908		1909		1910		Average.	
		Bushels per acre.	Period of growth, days.	Bushels per acre.	Period of growth, days.	Bushels per acre.	Period of growth, days.	Bushels per acre.	Period of growth, days.	Bushels per acre.	Period of growth, days.
Forsyth	Turkey Red	58.17	315	42.10	324	27.53	341	21.26	316	37.27	324
"	Gold Coin	54.77	318	38.47	324	17.77	346	16.28	326	31.82	328
"	Lofthouse	47.30	318	36.60	324	24.50	346	19.28	326	31.97	328
Glendive	Turkey Red			36.63	326	32.10	351	*		34.36	338
"	Gold Coin			34.60	326	29.93	355	*		32.26	340
"	Lofthouse			28.80	326	35.87	355	*		32.33	340
Billings	Turkey Red			29.03	313	19.80	336			24.41	324
"	Gold Coin			30.63	313	25.57	345			28.10	329
"	Lofthouse			25.97	313	21.83	345			23.90	329
**Fergus	Turkey Red					29.81	359	37.70		33.77	359
"	Crimean 1433					30.66	359	40.10		35.38	359
"	Kharkov 1583					32.83	359	48.00		40.41	359
"	Beloglina 1543					26.66	361	40.50		33.58	361
"	Red Russian 1532					18.35	364	29.40		23.87	364
"	Weissenburg 1563					24.66	377	35.30		29.98	377

* Winterkilled. ** In cooperation with U. S. Dept. of Agriculture.

SPRING WHEAT TESTS.

(From Bulletin 83 of the Montana Agricultural Experiment Station.)

STATION.	VARIETY.	1907		1908		1909		1910		Average.	
		Bushels per acre.	Period of growth, days.	Bushels per acre.	Period of growth, days.	Bushels per acre.	Period of growth, days.	Bushels per acre.	Period of growth, days.	Bushels per acre.	Period of growth, days.
Forsyth	Kubanka	29.83	101	.....	....	25.83	114	12.03	91	22.56	102
"	Ghirka	25.00	123	.....	....	25.27	92	19.50	91	23.26	102
Great Falls	Kubanka	.....	....	12.83	109	20.67	144	.....	....	16.75	126
" "	Glyndon	.....	....	12.77	118	27.00	144	.....	....	19.88	131
" "	Ghirka	.....	....	16.93	109	22.67	144	.....	....	19.80	126
East Terry	Kubanka	.....	....	.....	....	17.80	95	12.17	103	14.98	99
" "	Pringle's Champion	.....	....	.....	....	17.00	105	14.83	103	15.91	104
South Terry	Kubanka	.....	....	.....	....	.....	....	12.83	90	12.83	90
" "	Pringle's Champion	.....	....	.....	....	.....	....	11.37	90	11.37	90
*Fergus	Kubanka	.....	....	5.00	117	37.77	127	8.80	....	17.19	122
"	Ghirka	.....	....	3.33	117	36.66	123	16.00	....	18.66	120
"	Yellow Gharnovka	.....	....	15.00	117	39.33	128	8.20	....	20.84	122
"	Pelissier	.....	....	10.00	117	41.00	128	10.50	....	20.50	122
"	Purple Durum	.....	....	10.00	108	39.00	126	8.50	....	19.17	117
"	Galgalos	.....	....	7.50	105	40.16	122	18.50	....	22.05	113

* In cooperation with U. S. Department of Agriculture.

OAT TESTS.

(From Bulletin 83 of the Montana Agricultural Experiment Station.)

STATION.	VARIETY.	1907		1908		1909		1910		Average.	
		Bushels per acre.	Period of growth, days.	Bushels per acre.	Period of growth, days.	Bushels per acre.	Period of growth, days.	Bushels per acre.	Period of growth, days.	Bushels per acre.	Period of growth, days.
Glendive	Sixty-Day	.....	....	51.00	95	71.25	108	5.69	95	42.62	99
"	Canadian White	.....	....	46.25	103	83.13	113	3.81	95	44.40	104
Great Falls	Sixty-Day	.....	....	21.75	101	36.25	141	24.06	102	27.35	115
" "	Canadian White	.....	....	20.00	115	25.00	145	21.50	111	22.17	124
Harlem	Sixty-Day	51.81	92	27.06	94	104.50	113	.....	....	61.12	99.7
"	Canadian White	54.50	93	26.25	106	73.69	120	.....	....	51.48	106.3
Billings	Sixty-Day	.....	....	43.19	97	43.88	115	.....	....	43.53	106
"	Canadian White	.....	....	19.88	97	34.25	122	.....	....	27.06	109
East Terry	Sixty-Day	.....	....	.....	....	33.72	105	40.00	96	36.86	100
" "	Canadian White	.....	....	.....	....	30.81	118	26.00	106	28.40	112
South Terry	Sixty-Day	.....	....	.....	....	28.37	92	17.62	82	22.99	87
" "	Canadian White	.....	....	.....	....	19.44	103	19.64	93	19.54	98
*Fergus	Sixty-Day	.....	....	20.50	95	84.40	103	33.00	....	45.97	99
"	Canadian White	.....	....	5.00	108	82.60	121	14.20	....	33.93	114
"	Danish	.....	....	20.00	104	76 80	122	23.60	....	40.13	113
"	White Russian	.....	....	5.00	99	81.00	127	7.60	....	31.20	113
"	Sparrowbill	.....	....	15.00	104	69.00	124	20.10	....	34.70	114
"	Swedish Select	.....	....	15.00	99	77.90	121	22.30	....	38.19	110

* In cooperation with U. S. Department of Agriculture.

BARLEY TESTS.

(From Bulletin 83 of the Montana Agricultural Experiment Station.)

STATION.	VARIETY.	1907		1908		1909		1910		Average.	
		Bushels per acre.	Period of growth, days.	Bushels per acre.	Period of growth, days.	Bushels per acre.	Period of growth, days.	Bushels per acre.	Period of growth, days.	Bushels per acre.	Period of growth, days.
Harlem	White Hulless	25.90	100	7.87	106	47.63	114	.....	....	27.13	107
"	California	21.50	94	13.71	106	62.79	117	.....	....	32.67	106
Glendive	White Hulless	.....	....	20.90	85	29.30	113	1.20	106	17.13	101
"	California	.....	....	22.85	85	52.96	113	2.00	106	25.94	101
Great Falls	White Hulless	.....	....	15.57	112	*	....	13.73	110	14.65	111
" "	California	.....	....	12.08	116	*	....	23.46	113	17.77	114
Billings	White Hulless	.....	....	12.33	97	21.77	117	.....	....	17.05	107
"	California	.....	....	11.67	97	32.54	115	.....	....	22.10	106
East Terry	White Hulless	.....	....	.....	....	11.73	98	14.47	93	13.10	95
" "	California	.....	....	.....	....	22.29	103	20.63	98	21.46	100
South Terry	White Hulless	.....	....	.....	....	10.53	91	19.21	88	14.87	90
" "	California	.....	....	.....	....	17.47	98	8.75	93	13.11	96
**Fergus	White Hulless	.....	....	.....	....	42.40	89	16.40	98	29.20	93
"	California	.....	....	.....	....	.....	....	15.20	99	15.20	99
"	Manshury	.....	....	.....	....	45.70	90	13.00	99	29.35	94
"	Guy Mayle	.....	....	.....	....	33.20	100	12.19	103	22.65	101
"	Hanna	.....	....	.....	....	53.30	90	11.00	99	32.15	94
"	Bohemian	.....	....	.....	....	48.50	98	11.20	104	29.85	101

* In 1909, at Great Falls, the White Hulless and California barleys in the variety tests were destroyed by wind and drifting sand.
** In cooperation with the U. S. Department of Agriculture.

MISCELLANEOUS CROP TESTS.

(From Bulletin 83 of the Montana Agricultural Experiment Station.)

STATION.	CROP.	1906 Yield	1907 Yield	1908 Yield	1909 Yield	1910 Yield	Av. Yield
Forsyth	Bushels flax per acre	16.09	12.70	10.57	.....	10.35	12.43
"	Tons sugar beets per acre	4.13	6.28	.....	.....	.....	5.20
"	Bushels corn per acre	.....	.....	40.17	28.56	.....	32.36
"	Tons corn fodder per acre	.....	5.51	4.44	9.36	1.7	5.25
"	Bushels potatoes per acre	.....	160.70	10.80	281.57	98.78	137.95
"	Tons alfalfa per acre	.....	.....	.....	1.60	.....	1.60
"	Tons brome grass per acre	.....	.....	1.40	3.16	.....	1.78
"	Tons tall oat grass per acre	.....	.....	1.08	2.60	.....	1.84
Glendive	Bushels flax per acre	.....	13.55	14.86	.....	.....	14.05
"	Tons corn fodder per acre	.....	.....	2.90	3.28	1.50	2.56
"	Bushels potatoes per acre	.....	60.60	14.77	38.67	25.00	34.76
"	Tons alfalfa per acre	.....	.....	.....	1.34	.....	1.34
"	Tons brome grass per acre	.....	.....	.....	1.24	.....	1.24
"	Tons tall oat grass per acre	.....	.....	.....	1.40	.....	1.40
Great Falls	Bushels flax per acre	.....	.....	10.29	.....	11.71	11.09
" "	Tons corn fodder per acre	.....	.....	2.98	2.00	1.75	2.24
" "	Bushels potatoes per acre	.....	.....	68.90	95.00	86.25	83.38
Harlem	Bushels flax per acre	6.43	14.04	5.21	19.78	.....	11.36
"	Bushels potatoes per acre	89.87	67.97	108.50	80.00	.....	86.58
Billings	Bushels flax per acre	.....	14.57	2.04	.....	.....	8.35
"	Tons sugar beets per acre	.....	6.49	7.00	12.92	.....	8.80
"	Tons corn fodder per acre	.....	.....	2.90	2.48	.....	2.69
"	Bushels potatoes per acre	.....	113.26	98.43	82.33	.....	98.01
"	Tons alfalfa per acre	.....	.....	.67	1.42	.....	1.04
"	Tons brome grass per acre	.....	.....	1.00	.63	.....	.87
"	Tons tall oat grass per acre	.....	.....	1.00	1.22	.....	1.11
East Terry	Bushels flax per acre	.....	.....	.....	10.54	5.36	7.95
" "	Tons corn fodder per acre	.....	.....	.....	2.11	1.50	1.80
" "	Bushels potatoes per acre	.....	.....	.....	54.23	51.20	52.72
South Terry	Bushels flax per acre	.....	.....	.....	7.07	3.75	5.41
" "	Tons corn fodder per acre	.....	.....	.....	1.98	1.44	1.71
" "	Bushels potatoes per acre	.....	.....	.....	53.96	48.40	51.18
Fergus	Bushels flax per acre	.....	.....	10.30	17.60	.....	13.95
"	Tons corn fodder per acre	.....	.....	1.24	5.76	.....	3.50
"	Bushels potatoes per acre	.....	.....	.....	298.00	.....	298.00
"	Tons alfalfa per acre	.....	.....	.....	3.05	.....	3.05

Bulletin 83 goes on to state the profit from raising the different crops on dry lands and the conclusions reached by the writers after six years experiments in the following words:

For the man on the farm, the question of the relative amount of profit which may be expected from different crops is the important one. Table X shows the average yield of the different crops tested at all stations during all the years. Using these yields as a basis and assuming a fair average cost for raising the crop, the net profits per acre have been figured. We realize that the cost of production will vary with localities, and in different years. In computing the cost of raising the various crops, the prices for the different kinds of work are placed at the cost of such work in the open market. This permits of hiring the work done or allows wages for the farmer and deterioration charges on machinery, when the work is done by the farmer and the equipment is owned on the farm.

With the grain crops the following figures were used:

Plowing	$ 3.00 per acre.
Disking	1.00 " "
Harrowing four times	1.20 " "
Seeding	.40 " "

Seed at market price		
Harvesting, including twine	1.50	" "
Shocking	.30	" "
Threshing:		
Oats	.05	" bushels.
Brewing barley	.06	" "
Hulless barley	.07	" "
Wheat	.07	" "
With potatoes:		
Plowing, disking, harrowing	5.20	" acre.
Seed, 12 bushels at 60 cents per bushels	7.20	" "
Planting	1.20	" "
Cultivation during growth	1.00	" "
Harvesting	6.60	" "
Total	$21.20	per acre.

For sugar beets, since the matter of raising this crop is a matter of common knowledge, the production charge of $33.75 per acre was allowed.

With fodder corn:		
Plowing, disking, harrowing	$ 5.20	per acre.
Seed	.25	" "
Planting	.30	" "
Cultivation during growth	1.00	" "
Harvesting and curing	1.25	" "
Total	$8.00	per acre.

Dry Land Flax.

In the case of the forage crops, alfalfa and grasses, the only charge after the crop is planted would be for occasional disking during the summer and for cutting, curing and stacking the hay. Allowing that the expense for getting the crop started is distributed over the productive years, it seemed fair to accept the charge of $2.50 per acre as reasonable annual cost for raising dry land hay crops.

The prices of the different grain crops were taken from the "Yearbook" of the United States Department of Agriculture, and are the average market value of the various products for the past five years in Montana. The prices for alfalfa and grass crops are not from the "Yearbook," but are placed at the figure which seems to be the average price that has been paid in the various communities.

As might be expected, the largest net profit per acre is from potatoes. In

addition to its value for market purposes, this crop permits the farmer to get his land into good condition for succeeding crops. Intertillage may be carried on during growth, which prevents unnecessary loss of moisture by evaporation and permits the accumulation of water in the soil for succeeding crops. The use of intertilled crops will be discussed in connection with the crop arrangement studies taken up later.

Of the grain crops, and these will always claim the largest place on the dry farm, the fall or winter wheats are clearly most profitable. The Kharkov, an improved Turkey Red, stands at the head of the list, with an average of 40.41 bushels per acre, and a net acre crop profit of $21.30. As was noted in Table V, this variety has not been grown at all stations and so has not been subjected to so thorough a test as have the Turkey Red, Lofthouse and Gold Coin varieties. The Turkey Red, which has been very fully tested, shows a yield of 32.45 bushels per

Dry Land Macaroni Wheat.

acre, and a net profit of $14.49 in the average of all stations for the past four years. These returns indicate that Turkey Red winter wheat is adapted for very profitable growth on the non-irrigated lands of Montana.

Of the spring grains extensively tested, the Sixty-Day oats, flax, and hulless barley are among the most profitable.

It is of interest to note the yield and net profit from corn that was allowed to mature grain. The average of 32.36 bushels per acre, with an average net profit of $14.43, indicates the important place which corn is destined to hold as a grain producer in this state. When cut green and cured for fodder, we find it has a high value, producing 2.82 tons per acre, giving at an average price a net return of $11.74.

Turning to the forage crops we find alfalfa standing at the head of the list with a yield of 1.87 tons per acre and an average value of $12.15. Such production of very valuable hay, coupled with the fact that alfalfa is a soil improving crop, means much to the dry land farmer. As rotations come to be worked out, it is evident that the nitrogen-adding, soil-improving crop, which will be grown at intervals on successfully managed dry farms, will be the "king of forage crops," alfalfa.

Brome grass and tall oat grass are hardy growers and do well as hay producers. They are also valuable in dry land pasture mixtures.

Sugar beets evidently were not intended for commercial production on non-irrigated farms. While the yield is too low for this purpose, yet hog raisers and

Unirrigated Turkey Red Wheat.

dairy farmers on the dry farm may find that even 7 tons per acre is profitable when the crop is used as a stock food.

As a general summary of the six years' work, it is fair to say that the non-irrigated lands of Montana may be made to raise profitable crops under proper methods of tillage and crop management. Such yields as 32.45 bushels of Turkey Red wheat; 16.86 bushels of Kubanka spring wheat; 40.06 bushels of Sixty-Day oats; 32.36 bushels of matured corn; 105.32 bushels of potatoes, and 1.87 tons of alfalfa to the acre, in an average of all the tests in the various parts of the state for a period of six years, warrant this statement.

TABLE X. From Bulletin 83 of the Montana Agricultural Experiment Station.)—Average yields, farm values, cost of production and net profits per acre of different crops, from all stations, for all years tested.

CROP.	Average yield per acre.	Average market value.	Average farm value per acre.	Average cost of production per acre.	Net profit per acre.
	bu.				
Turkey Red fall wheat	32.45	$0.80	$25.96	$10.47	$14.49
Lofthouse fall wheat	29.45	.70	20.58	10.16	10.42
Gold Coin fall wheat	30.73	.70	21.51	10.25	11.26
*Crimean 1433 fall wheat	35.38	.80	28.30	10.68	17.62
*Kharkov 1583 fall wheat	40.41	.80	32.33	11.03	21.30
*Beloglina 1543 fall wheat	33.58	.80	26.86	10.55	16.31
*Red Russian 1532 fall wheat	23.87	.80	19.10	9.87	9.23
*Weissenburg 1563 fall wheat	29.88	.80	23.98	10.30	13.68
Kubanka spring wheat (durum)	16.86	.70	11.80	9.28	2.52
*Yellow Knarnovka spring wheat (durum)	20.84	.70	14.59	9.56	5.03
*Pellissier spring wheat (durum)	20.50	.70	14.35	9.53	4.82
*Purple Durum spring wheat	19.17	.70	13.42	9.44	3.98
*Galgalos spring wheat (durum)	22.05	.70	15.43	9.64	5.79
Ghirka spring wheat	20.57	.80	16.46	9.64	6.82
Glyndon spring wheat	19.88	.80	15.90	9.59	6.31
Pringle's Champion spring wheat	13.64	.80	10.91	9.15	1.76
Sixty-Day White oats	40.06	.45	18.03	9.85	8.18
Canadian White oats	32.43	.45	16.21	9.47	6.74
*Danish oats	40.13	.45	18.06	9.85	8.21
White Russian	31.29	.45	14.04	9.42	4.62
*Sparrowbill oats	34.70	.45	15.61	9.58	6.03
*Swedish Select oats	38.19	.45	17.14	9.75	7.39
White Hulless barley	19.05	.70	13.33	9.43	4.03
California barley (brewing)	21.73	.60	13.07	9.30	3.77
*Manshuri barley (brewing)	29.35	.60	17.61	9.76	7.85
*Guy Mayle barley (hulless)	22.65	.70	14.85	9.68	5.17
*Hanna barley (brewing)	32.15	.60	19.29	9.93	9.36
*Bohemian barley (brewing)	29.85	.69	17.91	9.79	8.12
Fall rye	27.24	.68	18.52	9.99	8.53
Flax	10.45	1.60	16.72	9.45	7.27
Corn	32.36	.74	23.95	9.52	14.43
Potatoes	105.32	.60	63.19	21.20	41.99
	tons				
Corn cut green and cured for fodder	2.82	7.00	19.74	8.00	11.74
Alfalfa	1.87	9.00	16.83	2.50	12.15
Brome grass	1.28	9.00	11.52	2.50	8.95
Tall oat grass	1.45	5.00	7.25	2.50	4.64
Sugar beets	7.00	5.00	35.00	33.75	1.25

* Grown at Fergus County Station only.

CROP YIELDS ON UNIRRIGATED LANDS.

Better than any theories of what the unirrigated lands of Montana can produce are the concrete evidences of the products themselves that have been raised on lands of this character. The yield of wheat in 1911 has not been fully ascertained, but will, no doubt, be nearly twice the yield of 1910; yields of oats, barley, rye, sugar beets and tame grasses will be far greater than last year; and the product of flaxseed will probably be quadrupled. A preliminary estimate of the grain crops of 1911, given out by the Department of Agriculture before threshing was completed, is believed to be below the amount produced; but nevertheless it shows a wheat production of 16,919,000 bushels against 10,560,000 in 1910, an increase of sixty-four per cent; 19,090,000 bushels of oats against 13,300,000 in 1910 an increase of forty-three and one-half per cent, and 1,934,000 bushels of barley against 1,450,000 in 1910, an increase of nearly thirty-three per cent,

Pumpkins Raised on Dry Land.

The greatest part of this increased production has been harvested on unirrigated land, of which many acres were farmed for the first time, and is proof that the farming industry is developing rapidly though as yet but one-fifteenth of the arable acres have been reduced to cultivation.

At the Montana State Fair held at Helena in September 1911, a collection of grains, grasses, vegetables, and fruits was shown such as well informed visitors from outside of Montana say could be got together in few, if any, of the other states. The splendid exhibits of corn attracted perhaps the most attention. All counties, save four, were represented; and

the products raised on unirrigated lands excited the admiration of all beholders and puzzled the judges to decide which one was best when all were excellent. The best products will be sent to the expositions that are to be held in St. Paul, and in other cities, to win new triumphs and to bear witness to Montana's greatness in agriculture.

Notwithstanding the fact that the year 1911 has been one of short crops in less favored regions, farmers in every county of Montana have harvested prolific crops. An illustration is given on another page of a head of spring wheat that contained 143, large, firm, grains that was gathered in the unirirgated field of W. D. Darst, near Polson, Flathead County. This crop threshed 51 bushels to the acre; and like yields were made on a great many acres recently brought into cultivation as a result of the opening to settlement of the Flathead Indian Reservation.

A volume could be filled with statements of yields of crops on the unirrigated farm lands of Montana. The story is told in a general way by the statistics of the average production per acre of the leading crops; but some instances will be set down here to bring the matter from the vagueness of a general, to the definiteness of a particular, statement.

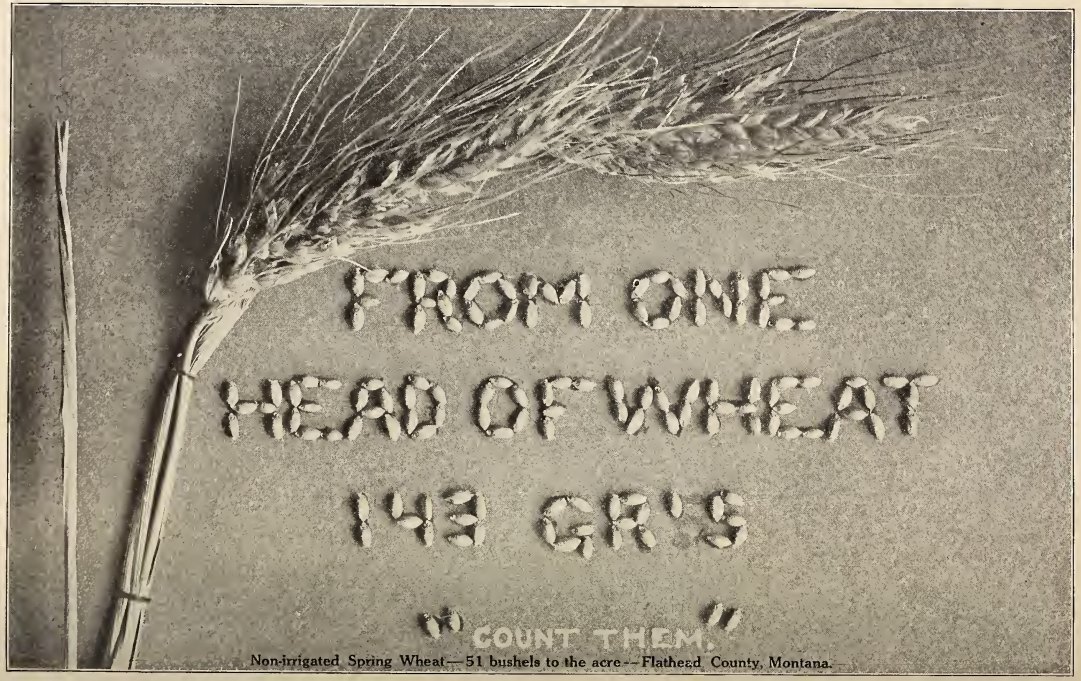
The following reports, relating to crops of former years in a few counties, have been saved:

Valley County: Henry Holmes of Ashfield threshed out his 240 acre crop of oats last week and it netted him 65 bushels per acre. This looks to us like a record that will be hard to beat, especially as this was a dry farming crop. From 18 acres of land Nick Schmitz threshed 22,039 pounds of oats and 5,800 pounds of barley. About 14 acres of the land was planted to oats so that the average yield was over 52 bushels per acre and is considered an excellent yield.

Custer County: Chas. Daly of Beebe came to Miles City, Tuesday afternoon. He brought in samples of the results of his dry land farming, which will be taken to Billings for exhibition at the dry farming congress. There is no better corn grown anywhere than that which Mr. Daly has. The corn is Northwestern Dent and squaw, some of the ears being over a foot long. He planted thirty acres to corn, and has 25 acres of oats which yielded 60 bushels to the acre; thirty acres of speltz and a small acreage of winter wheat was planted as an experiment. J. B. Kempton of Terry had his crops threshed out with the following results: Rye, 37 bushels; oats, 58 bushels, and speltz, 48 bushels per acre.

The folowing reports were not picked from the best ranches in the Judith Basin, but were taken from any place that we happened to hear of, regardless of location or the character of the ranch, says "The Inland Empire," of Moore:

Fergus County: E. O. Hedrick—Wheat, 150 acres, 5,100 bushels; average, 34 bushels per acre. Graded No. 1. K. S. Nelson—Wheat, 135 acres, 7,975 bushels; average, 51½ bushels per acre. The first 12 acres of this threshed out 873 bushels, an average of 61½ bushels per acre. John Warren—Wheat, 100 acres, 2,700 bushels; average, 27 bushels per acre. Scott Weaver—Wheat, 60 acres, 2,550 bushels; average 42½ bushels per acre; 30 acres of volunteer wheat, first sown three years ago, made 18 bushels per acre. Oats, 25 acres, 1,175 bushels, averaging 47 bushels per acre. Granville Williams—Wheat, 3,800 bushels; average, 38 bushels per acre. Graded No. 1. Dr. T. B. Stuzman—Wheat, 17½ acres, 625 bushels; average, 35¾ bushels per acre. Luther Key—Oats, 16 acres, 1,200 bushels; average, 75 bushels per acre. G. L. Straight—Wheat, 36 acres, 1,200 bushels; average 33 2-3 bushels per acre. Guy Penwell—Wheat, 90 acres, 2,430 bushels; average, 27 bushels per acre. Oats, 40



Non-irrigated Spring Wheat—51 bushels to the acre—Flathead County, Montana.

There are Many Others as Good as This One.

acres. 1,200 bushels; average 30 bushels per acre. These oats were sown too thin and late in June. Otto Pickett—Wheat, 107 acres, 3,000 bushels; average, 28 bushels per acre. Benjamin Lethleau—Wheat, 19 acres, 627 bushels; average, 33 bushels per acre. Oats, 7 acres, 490 bushels; average, 70 bushels per acre.

Gallatin County: Reports of the yields of 76 fields of grain embracing 7,490 acres, grown without irrigation in Gallatin County show an average yield of 42 bushels per acre and an average value of crop per acre of $35.39.

Madison County: Henry M. Rundell, with his brother Whit Rundell, operates a large farm near Pony and were the first farmers in that neighborhood to grow wheat without irrigation. In the fall of 1897 they broke up 50 acres of pasture land and sowed it to Crail Fife wheat as an experiment; and the crop from this field threshed 1,073 bushels of hard winter wheat. This was the first wheat grown in that vicinity without irrigation. They were so well satisfied that they determined never again to grow spring wheat and since then have raised some bumper crops. One year their unirrigated wheat crop averaged 73 bushels

Dry Land Rye.

and the irrigated wheat only 61 bushels to the acre. Some of their neighbors were slow in following suit but unirrigated winter wheat is now grown throughout that section and a field of irrigated wheat is an exception. Rundell Bros. irrigate other crops and have the reputation of being among the most successful farmers in the county.

In 1909 the State Bureau of Agriculture, Labor, and Industry received a letter from Oscar Johnson giving an account of the crops grown on his farm in the Arrow Creek district in Chouteau County where farming is a new industry. Mr. Johnson took up public land, broke 150 acres, planted 141 acres in flax, and threshed 3,416 bushels of seed of a superior quality that he sold for $2.28 a bushel. The returns from his flax crop was $7,768.48, and he had in addition for use or sale 281 bushels of spring wheat grown on nine acres, 21 bushels of navy beans grown on one acre, and 93 bushels of barley grown on one and one-third acres.

A. P. Smith, of Hall, Granite County, writes that the following article

quoted from "Marvelous Montana," a magazine published at Great Falls, is correct:

"We dry farmers have conquered, and the croakers are speechless," writes Arthur P. Smith of Hall, Montana, who farmed 125 acres last year, having 100 of it in wheat, 10 in oats, and the rest in alfalfa, barley and garden truck.

He reports as follows:

"This has been the hardest year, not only for dry farmers in this section, but for all others, irrigators as well, since 1889. We came through 1909 with somewhat less precipitation than usual, followed by a winter with about 12 inches of dry snow in two falls, each melting and running off while the ground was frozen, and thus we have had, all told, since September, 1909, only about eight inches of rainfall. And yet there are no crop failures. Our crops are not as abundant as usual, but they are fairly good.

"The precipitation of 1909 was only about three-quarters of the normal, totaling 12 inches. The precipitation in the spring after the snow was gone was about four inches. My soil is a sandy loam, with clay subsoil. I plow about six inches. In the fall we merely plow, letting it lay till spring, when we disc and harrow it. For winter grain we find spring plowing best, for we turn under the weeds and volunteer grain, and immediately after plowing we disc, harrow and pack the ground to hold the moisture. After seeding we harrow again with the teeth turned pretty well down. I had no crops burn; all matured, but our spring crops did better than the winter grain. All crops started late and this was true under irrigated conditions, as well. My spring plowed land held out better than the fall plowed, and the rains during the growing season totaled about four inches, which did much good. I hitch a section of harrow behind the Campbell packer and harrow and pack at the same time, and I find it the best way. Besides a subsurface packer, I use a weeder.

"My wheat yielded 23 bushels to the acre, and my oats weighed 40 pounds to the bushels. In most cases my neighbors accomplished in accordance with the proportion they followed dry farming methods.

"My experience the past five years leads me to conclude that we are just as sure of our crops if we follow scientific methods as we are by irrigation. I have been called all kinds of a fool since I started out at dry farming, and yet the first year I had as high as 35 bushels of wheat to the acre, and the doubting Thomases then said it was because it was a favorable year. I kept on raising crops, and others took up the method until wheat is now raised hereabouts by thousands of acres. I am as yet the only farmer in the valley to use a subsurface packer, and the only one to apply dry farming methods to vegetables. Until a year ago I was the only one to harrow grain, and the Thomases stood back and said: 'Look at the fool harrowing up his grain.' But now, one after the other is taking it up, and many who said grain could not be raised here are jumping into the ring and getting busy. One thing is certain, that if we can get crops such a year as 1910 has proven, we can get them any year, and we need fear for nothing in another bad year. Many have said, 'Just wait till you get a year like 1889, and then you will see that dry farming is a failure,' and they have waited, and the year has come and gone, and they have seen and appreciated that it is not a failure, but instead is the biggest success known. Yes, sir; the croakers in Montana are speechless. I have not only demonstrated what can be done for the benefit of my neighbors, but I have sent a lot of samples of my grains and vegetables to the International Dry Farm Products Exposition, which was held in connection with the fifth Dry Farming Congress at Spokane, and I captured some of the best awards with them. Dry farming tells."

Below will be found some reports of crops in 1911 on farms, in most cases stated to be unirrigated, and in others presumed to be so from their location:

Beaverhead County.

Dillion Tribune: Dr. Bimrose, one of the enthusiastic advocates of dry farming

in this section, is the owner of as pretty a piece of land as can be found in the country. Dr. Bimrose has his entire acreage under cultivation, farming with dry methods, and expects to gather a bumper crop. His field of turkey red is in excellent condition. He has a fine lot of potatoes and a great field of Canadian peas, besisdes an excellent truck garden. The doctor has adopted scientific methods in his farming operations and his optimistic outlook is fully warranted by the condition of his crops.

Broadwater County.

Near the northern boundary of Broadwater County on the bench lands east of the Missouri River, about 18 miles from Helena, the Avalanche Land Company has engaged in farming on a big scale and has proved that a large acreage in that neighborhood is adapted for successful farming. From a reliable source it is learned that 395 acres of sod land that was broken in July 1910 yielded about 7,900 bushels of turkey red wheat that

Dry Land Peas.

graded "No. 1 Hard" at Duluth where it was sold. The yield, about 20 bushels to the acre on unirrigated land seeded for the first time was profitable and future yields are likely to be even greater. The company raised 60 bushels from 2 sacks of Kharkov, an improved variety of Russian Red Wheat, and will use them as seed. The farm is known as the Word and Parker Ranch, and in 1912 crops from 600 acres of winter wheat and 300 acres of rye and spring wheat will be harvested.

R. E. Slawson and Charles Brokaw of Townsend are reported to have had yields of 29 and 28 bushels of Turkey Red wheat per acre respectively on non-irrigated land. W. D. Neild of the same neighborhood grew 52 bushels of soft winter wheat on 35 acres of land, and Perkins and Jewell,

of Canton, had a crop of Turkey Red wheat that averaged 33 bushels to the acre.

Cascade County.

Great Falls Tribune: On the Joseph Sarzin ranch, three miles south of Stockett, where threshing had been completed, 49 acres of land sown to winter wheat produced 2,200 bushels or an average of 45½ bushels to the acre. Thirty acres of oats produced 1,600 bushels or an average of 50⅓ bushels; a tract of eight acres of barley produced 47 bushels to the acre, but the banner crop was from a one acre piece of flax which threshed 25 bushels. This latter piece had previously been in alfalfa.

On the ranch of Joe Kornosky, adjoining the Sarzin farm, 45 acres of winter wheat, of June breaking, produced 2,080 bushels or 46 bushels to the acre; eight acres of new breaking netted 45 bushels to the acre. Mr. Kornosky had altogether 100 acres in winter wheat, some of which did not run as heavy as the above mentioned artcts, and the whole netted 3,886 bushels or a general average of about 39 bushels. On the farm of Maurer and Kirschwing, fifteen miles south of the city, winter wheat threshed 37 bushels to the acre. On the Jerome Betts ranch about twenty-six miles south of this city the owner had in 80 acres in winter wheat upon land which had been summer fallowed. This system of cultivating the land proved its own reward as the yield from this piece was 3,439 bushels, or 43 bushels to acre. Another tract of 80 acres belonging to the same man and which has not yet been threshed, is expected to produce about 40 bushels to the acre. Just across the road from the Betts farm upon the old J. P. Heber ranch now owned by August Holdorf, who recently came here from Washington, was a field of 149 acres of winter wheat which threshed 5,240 bushels, or an average of 37½ bushels.

Dry Farm 7 Miles West of Great Falls.

Chouteau County.

Galata Journal: W. D. Easter was down from his claim Sunday. He left us a sample of oats from the Pete Wagner farm, north of town, which Dad thinks will yield at least one hundred bushels to the acre. The samples are about four feet in height, very heavily headed out, and are some of the finest specimens we have ever seen.

Harlem Correspondence Great Falls Tribune: Charles H. Reed, who last week sold his livery and feed business to Charles Tubbs, and will devote his energies to farming in the future, reports that the 103-acre field of flax that he planted on sod ground will average ten bushels to the acre. W. G. Buckley, who harvested and sold 300 tons of bluejoint hay from his 320-acre ranch this summer, has in addition purchased from Anson Weimer and James McKenzie 150 tons of hay in the stack, which he will bale.

Fort Benton River Press: One of the best yields of wheat on bench land farms in this vicinity is reported by R. W. Buckland of Highwood, who secured an average of forty-two bushels from an eighty acre field. Mr. Buckland cultivated the land in accordance with methods recommended by agricultural experts, and the good results will encourage a continuance of the work along those lines.

John Buckland is threshing a small tract of wheat raised on the bench west of

Highwood, which looks as though it would go fifty bushels to the acre. John Jacoby, on the bench between Highwood and Fort Benton, had excellent showing of wheat and flax, but unfortunately he lost most of it by the hail storm of ten days ago. Capt. George H. Stevens has completed threshing his one thousand acre tract of winter wheat, and it is reported that his yield averaged a trifle over seventeen bushels to the acre. This is a typical dry land farming venture, and the work has been carried on strictly according to approved scientific methods.

Dawson County.

Beaver Valley Gazette: The past week still brings many samples of grain into this office, which shows to anyone who might chance to see, just what Dawson county can do. The samples from the farm of Geo. Woods can't be duplicated anywhere. All who see them speak well of the samples. Those of the popular J. J. Owen are not behind them either. We have some also brought in from C. W. McCabe's and it looks from the many other samples that we have on exhibition as if this year had brought very much of an average crops everywhere. County Commissioner W. A. Cameron returned yesterday from a trip to Edgehill, Dennis, Carlyle, Baker, Westmore, Ismay and other points, on road and bridge business for the county board. Mr. Cameron reports that these communities are doing good road work, the roads especially north from Baker, being in fine shape. As to crops, Mr. Cameron said that the late flax, of which there are thousands of acres growing, is in splendid shape, and will give a big yield. The oats crop in this region is slight, but the corn is looking well. The wheat harvest has proved light, but the quality is excellent. There is some fair early flax but the hot winds got the better of most of it. The vegetables are fair, though the potato crops are light.

Fergus County.

Fergus County Argus: A. W. Stoddard's ranch on the Cottonwood bench, where harvest was completed this week, shows an average of thirty-nine bushels for the two hundred and fifteen acre tract. The field was slightly touched by hail, or it would have given an average of better than forty bushels to the acre.

Moore Inland Empire: Henry J. Weigert, who is residing on the old Court Wunderwald place three miles northeast of town, was a pleasant caller at the Empire office the first of the week. He recently finished threshing and stated that his wheat went a trifle better than forty bushels to the acre on the eighty acre tract that he had in and graded number one.

Lewistown News: County Commissioner J. M. Parrent, who is in the city today from Kendall, says that a farmer living five miles north of the gold camp has just threshed what many believe will be the record spring wheat crop in Fergus county this year. A field of eighty acres, owned by Thomas Phillips, yielded an average of 36 bushels per acre. This is by actual measurement, as the entire field has now been threshed. The wheat is Scotch Fife, and the quality is of the very best.

Winter wheat yields in that section, says Mr. Parrent, are also very good, and altogether farming conditions are bright in that section.

Flathead County.

Flathead Courier: If you want to see a grain display equal to if not better than anything ever shown in Montana, drop into the First National bank of Polson and there you will find it. There is wheat, oats and barley, flax, timothy and alfalfa, all grown within a short distance of Polson. And such grain, it will make you hold your breath in amazement. E. S. Gilmore who in partnership with his brother, purchased the Phio Finley place two miles south of Polson last spring, threshed wheat on it last week. There was an even hundred acres of it and it averaged thirty-two bushels to the acre. Mr. Gilmore thinks this is a record crop and asks if there is anyone who can beat it. The Gilmores' came from Madison county, and know grain land when they see it, and they located just as near Polson as they could get. That their judgment was good is proven by the yield of the crop just threshed. E. S. Gilmore will at once move to the place and improve it.

Gallatin County.

Belgrade Journal: Frank Kremer, a large holder of Gallatin valley land, was in town from his ranch last Thursday and gave us the figures of sixty acres of turkey red. The yield was exactly forty bushels to the acre. This is dry land on Camp creek. Tom Cloyd was in town a few days ago from his Dry Creek ranch and he informed us that he had just finised threshing and on a field of 12 acres sowed to oats had a yield of 96 bushels to the acre. How is that for a dry land proposition?

Bozeman Chronicle: Threshing has now commenced in the west end of the valley, and the yields thus far reported are fully up to expectations. W. M. Carpenter of Logan, has just finished threshing from a forty acre unirrigated tract which went thirty-eight bushels to the acre of turkey red wheat, and W. T. Irwin threshed thirty-two and one-half bushels to the acre from a fifty acre tract on his dry land farm south of Three Forks. Ben Walker threshed one hundred and twenty-five bushels of oats to the acre from a dry land tract on his ranch about eight miles north of town. Frank Hoell has finished threshing on his farm on the reservation which produced a dry land crop of sixty-seven bushels per acre of Crail Fife wheat.

Bozeman Republican-Courier: One of the best crops raised in Gallatin county this season by an individual farmer is that of Peter Neunfeldt, whose property is

Non-Irrigated Wheat Field.

located near Belgrade. Mr. Neunfeldt had 100 acres planted to Turkey Red wheat which averaged 42½ bushels per acre in yield; he had 240 acres planted to club wheat which yielded 36 bushels to the acre; and he had 17 acres in oats which yielded 72 bushels per acre. The total number of bushels of Turkey Red wheat produced on the Neunfeldt farm were 4,259; the total number of bushels of club wheat produced were 8,595, and the total number of bushels of oats produced were 1,226. The crop should net Mr. Neunfeldt about $10,000. The remarkable part of the report of the Neunfeldt crop is that it was raised on non-irrigated land.

Granite County.

Deer Lodge Silver State: William A. Griffith of Granite county, was in Deer Lodge last Friday night and Saturday morning on his return home from a business trip to Race Track. His threshing machine and crew were then employed in threshing grain at Oscar Richards' place, eight miles west of Hall. He says there are some big crops of grain grown on dry land in that section, in some cases as high as 40 bushels of wheat to the acre. It is selling at about 73 cents a bushel, or $1.25 a hundred. He is working up this way with his machine, and will shortly be threshing grain in this valley.

Lincoln County.

Eureka Journal: C. S. Forde brought in two stools of Red Chaff wheat this week one of which had one hundred and sixteen stalks and the other ninety-six. They

were fine specimens of what our strong soil will produce. It was grown on the ranch of Wm. West east of town. Mr. West has a crop of oats five to six feet high on a ten acre field from which 165,000 feet of pine lumber was taken. Mr. Hans Norgaard brought in some of the kind of farm products last Tuesday that makes us proud of our valley. He had second cutting of alfalfa nearly four feet high and six foot timothy and oats.

Lewis and Clark County.

On the Lewis and Clark experiment farm on the Spokane ranch, near East Helena, the yields in 1911 were very good as the accompanying table shows; and the results of the experiments that were made to determine whether harrowed or unharrowed crops made the better yields are also given.

YIELDS ON THE LEWIS AND CLARK DEMONSTRATION FARM IN 1911.

CROPS.	Bushels per acre.	
	Harrowed.	Unharrowed.
Sixty-Day Oats	35.56	38.13
Swedish Select Oats	38.13	43.31
Pringles Champion Wheat	19.83	20.73
Pellisseir Wheat	18.57	19.10
Kubanka Wheat	18.10	17.23
White Hulless Barley	19.77	20.33
Turkey Red Wheat	17.27	19.07
Guy Mayle Barley	24.27	25.30
Turkey Red Wheat Rotation		27.67
Flax		6.34

Meagher County.

Judith Gap Journal: Nils Larson's threshing rig has been operating eight to ten miles northwest of Judith Gap, between Barrows and Buffalo. Mr. Larson hands in the following yields of wheat:

John Edwards, two hundred and fifty acres, yielding twenty-five bushels.

Mr. Griffith, eighty acres, twenty-four bushels.

Mr. Meyers, twenty-five acres, twenty-eight bushels.

Mr. McLeach, one hundred acres, twenty-five bushels.

Mr. Larson says that the wheat threshed by Miller Brother's rig on the Hastings place, went fifty-two and one-half bushels per acre. There were forty acres of this field, and Mr. Larson says he saw it before it was cut, and never saw a finer stand of wheat. In this territory, Mr. Larson says the cats he has threshed has run from sixty to seventy bushels per acre.

Judith Gap Journal: John Milne, who owns a farm between D. W. Pulver's ranch and Swimming Woman creek, had eleven acres of winter wheat that yielded a fraction over thirty-five bushels per acre. While the crop was nearing maturity it attracted the attention of all the neighbors and visitors to the Swimming Woman country. The estimate of the probable yield was varied, but D. R. Bumford came the nearest to guessing it. He placed the yield at forty-five bushels. Mr. Pulver threshed the crop this week, and the eleven acres yielded five hundred and eighty-nine bushels, or fifty-three and one-half bushels to the acre.

Missoula County.

Ronan Pioneer: L. A. Cox and Son finished threshing this week and report having eight thousand bushels of oats and five thousand five hundred bushels of wheat. The oats averaged fifty-five bushels per acre, and the wheat thirty for

Flax

fall sown, and a little better than twenty for spring sown.

J. D. VanLiew reports his threshing done and that his wheat averaged a little better than twenty bushels per acre and oats close to thirty-five bushels per acre. This he thinks is very good, considering that it is the first crop and on new ground.

Winter Wheat.

Many pieces of winter wheat in the Ronan country are already up and growing nicely. While several steam threshers are still busy from daylight until dark taking care of this years crop, the workmen can look over into an adjoining field and see another crop coming on. Realistic scenes of this nature are sure to remind one and all that we are living in the very heart of one of the best farming sections on the continent.

Pete Lucier was up from near the Mission last Saturday and reports his threshing done. His barley averaged forty bushels per acre and wheat in his vicinity he said was going around thirty to thirty-five bushels per acre. The new machine operated by Oliver Gebeaux is turning out about one thousand four hundred bushels per day and is doing good work.

Park County.

Clyde Park Herald: R. D. Hoff completed threshing his grain crop Thursday evening. He had approximately five hundred acres, and his yield was eleven thousand bushels, all of the Turkey Red variety. Of the five hundred acres 383 was a volunteer crop. In the volunteer crop there were one hundred and twenty-five acres which have produced a third consecutive crop without planting. The first year, after being beaten down by a terrific hailstorm, six hundred and nine bushels were harvested, the second year it produced one thousand five hundred and fifty-five bushels, and this year the yield was two thousand five hundred and forty-one bushels. The grain is splendidly matured, and Mr. Hoff has already sold seven thousand bushels at seventy-six cents per bushel.

J. H. Westerfeld, who is farming on the Rock Creek ranch of O. S. Holliday, has threshed forty-two acres of Turkey Red wheat, receiving an average of thirty-eight bushels per acre therefrom, the grain weighing out from sixty-eight to seventy pounds to the bushel. His barley also threshed fifty bushels to the acre, and his field peas, of which he cut three and one-half acres, yielded ninety-seven bushels.

Powell County.

Deer Lodge Silver State: F. J. Bissonette of below Gold Creek, was in Deer Lodge last Thursday on business. That gentleman is quite enthusiastic over the results attained this year in dry land farming in his section. He says he has raised 67 bushels of oats and 27 of wheat to the acre, without irrigation, while five acres in barley yielded him 130 bushels. He says his is not the only success in a dry farming way, as his neighbors have more than exceeded their expectations.

Sanders County.

Sanders County Signal: Mr. Waylett came in Wednesday from the Little Bitter Root. He brought in a couple of bunches of grain that beat anything we have seen this year. The wheat is fine and the oats are hard to beat. This grain was

Dry Cabbage Patch.

raised on the sagebrush flat on ground plowed last spring. The seed was harrowed in with a spring tooth harrow. This speaks well for this section.

Plains Plainsman: E. E. Williamson and his parents, Mr. and Mrs. A. P. Williamson of Stevensville, were in the city Tuesday from Camas prarie, where the son has a farm. In speaking about farming conditions on the reservation E. E. said he was well pleased. His oats crop averaged fifty bushels per acre and as fine a quality as he raised in the Bitter Root, where the family have farmed for over thirty years. The hay crop was good and he sold eighty tons and has plenty left to feed through the winter. He is of the opinion that the soil in his vicinity is first class and that in another year the prairie will be known as one of the producers of western Montana.

Sweet Grass County.

Big Timber Pioneer: Threshing has been in progress for a number of days in the northern and eastern parts of the county, sections where non-irrigated farming is rapidly extending. Some remarkable yields are reported from land formerly considered worthless, except for grazing purposes. Unfortunately efforts to secure returns are not as successful as desired, hence it is impossible to publish a complete list. Enough is known, however, to make it certain that where ordinary care was taken in tilling some excellent crops were harvested. Among those who have finished the seasons work are G. B. Pope of Howie, and Sam Andrews of White Beaver. The former threshed twenty-seven bushels of Turkey Red wheat per acre from a field of one hundred and eighty acres. Mr. Andrews' yield from a one hundred acre field, was three thousand two hundred and eighty bushels of the same kind of grain. It is said that in other cases these figures were beaten, but nothing authentic has been learned, consequently the alleged yields are not here given.

Rosebud County.

Forsyth Times-Journal: Recently the Helena papers printed a story to the effect that from twelve acres there had been produced eleven hundred bushels of oats.

Rosebud can see Lewis and Clark and come back with a raise. On the farm of Major Edwards from a measured nine acres of oats there were threshed eleven hundred and two bushels of forty-five-pound oats. This was not a selected tract, but the first setting of the thresher and nothing particular was thought of it. This was the first crop from the land, which was plowed last fall.

Miles City Independent: J. F. Hackley of Forsyth, who is in the city, states that on the Big Flat, south of Forsyth, harvesting is now under way, and some of the finest wheat crops of the year are yielding to the harvester. In many of the fields, threshing is under way, and the yield in many instances amounts to thirty bushels to the acre. This land is situated on a bench, but for productivity, is making a good showing. Combination reapers and threshing outfits are in use on the fields.

Teton County.

Cut Bank Pioneer: "I have visited every experiment station on both the Northern Pacific and Great Northern railways in South Dakota, North Dakota and Montana and I must say that for luxurance of growth, uniformity of stand and pros-

pective excellence of yield the crop in the Cut Bank community has not an equal. The Durum wheat on the Great Northern experimental station farm is positively the best I have ever seen in Montana." These are the words of Prof. Thomas Shaw, after he had returned from an inspection of the crops on the local experimental farm, conducted by David L. Hope. Professor Shaw stated that all grains were filling well and that the prospects were for a very large yield of grains in this community.

Conrad Independent: Harvest was started full blast Monday morning in this section, and the farmers are more than busy in the fields this week. The yield is most satisfactory, taking the figures from the few places that have been threshed. The big combine harvester of P. J. Nason's was started up the first of the week, and one of the large fields belonging to Ryan and Withee was cut, the average being about thirty-seven bushels to the acre. Other crops are averaging up near nearly as well, and it is conservatively estimated now that there will be practically one million bushels of grain threshed, in the territory tributary to Conrad.

Conrad Correspondence Great Falls Leader: Having had an abundance of rain during the growing season, the farmers merchants, and in fact everyone in Conrad and vicinity, are wearing the smile that won't come off. While the story of the threshers cannot yet be told, as harvesting machines are just starting their work, yet a satisfactory and conservative estimate can be given both as regards the yield and quality of crops.

From a careful estimate given The Leader by the best posted man in the farming operations in this section, it was learned that there were about seventy-one thousand acres planted to wheat, fifty thousand acres in oats, and about ten thousand acres in flax. It is estimated spring wheat will run from eighteen to forty bushels per acre, winter wheat from twenty to thirty-five bushels, oats from thirty-five to one hundred bushels and flax approximately twelve bushels per acre. The quality has been pronounced A No. One. The average yield of hay per acre has advanced several points in this section this year. On old ground farmers have this year had three cuttings of alfalfa averaging two tons to the acre, while one year old alfalfa averages one and a half tons per acre. Potatoes and other farm products promise an entirely satisfactory yield. There were approximately twenty thousand acres of new ground broken around Conrad this year.

Valley County.

Valley County Independent: Some fine samples of corn, potatoes and plums grown on the ranch of C. W. Wilkens, seventeen miles southeast of here, were brought to the city by him and are now on display at the real estate office of Sidney J. Rundle. These specimens are as good as can be produced in any state and go to show what can be done on Montana soil. We have thousands of acres of just such soil yet unoccupied that will produce as fine as one wishes and just waiting for the homesteader.

Valley County News: The threshing machine told its first story west of town this week at Frank Miller's place and Jas. Greenan's. Mr. Miller's wheat yielded about twenty-seven bushels per acre and his oats about fifty bushels per acre. It is claimed Mr. Greenan's grain was better than the Miller crop, but we have not learned the yield.

Malta Enterprise: R. V. Tucker reports a good yield of crops from his Strater dry land farm .From 49 acres 2,650 bushels of choice oats were threshed. However, Mr. Tucker states that twelve acres of the oats were destroyed by hail and this would reduce the area to 37 acres and the yield a little better than 70 bushels to the acre. Flax on the Tucker farm promises an excellent yield though not yet threshed.

Yellowstone County.

Laurel Outlook: F. W. Schaurer, a prosperous farmer residing about four miles northwest of Laurel, has completed threshing his large crop of grain. In all he had three hundred and twenty acres of wheat, three hundred acres of which

was Turkey Red winter wheat was grown on summer fallow land and averaged thirty bushels per acre. On two hundred and twenty acres of new sod land the winter wheat yielded twenty-three bushels per acre. His entire crop of three hundred and twenty acres threshed out seven thousand seven hundred and fifty-five bushels.

From twenty acres of oats he harvested one thousand two hundred bushels of oats. Aside from the grain crop above mentioned, he had a good crop of alfalfa. Mr. Schauer has one thousand four hundred acres of land, the larger portion of which is dry land. At present he is busily engaged in picking apples. The Wealthy variety is now ready for the market and he estimates that he will have five hundred bushels which he will ship.

During the past few days the Young Bros., have been engaged in threshing the wheat grown on the land of the Northwest Investment company. The forty-five acres joining the townsite on the north averaged twenty-four bushels per acre. This was Turkey Red wheat. On the northwest part of the place they threshed eight acres of Turkey Red wheat that made fifty-one bushels per acre with the weigher on the machine set at sixty-eight pounds per bushel. O. A. Young was in town yesterday with samples of wheat grown on the place which he had prepared for the Burlington exhibit car. Besides the wheat he had specimens of velvet chaff wheat that stood five feet tall with heads fully five inches long and a seven headed wheat which resembled freak heads. These latter kinds were spring grain.

Laurel Sentinel: Henry Herbert, residing near Hawthorne, threshed 38,136 pounds of oats from 11 acres, or 1,278 bushels of 32 pounds.

Unirrigated Wheat, Park County.

FARM LANDS AND HOW TO GET THEM.

Private Lands—Railroad Lands—State Lands—Government Lands—Table of Unappropriated Public Lands.

The farm lands in Montana are in the ownership of (1) private persons; (2) the Northern Pacific Railroad; (3) the State of Montana; and (4) the Government of the United States.

There are many opportunities to purchase lands in private ownership at prices which seem low in comparison with the productiveness of the soil, the returns which such investments yield, and the prices at which lands are selling in other states. The tendency is to divide large stock ranches into small tracts and offer them for sale for farms. Large grain ranches are also being sub-divided. As population increases, transportation facilities are improved and intensive cultivation becomes more general, owners who acquired large tracts at very low prices in early days find it to their advantage to sell a part of their extensive holdings and to cultivate the balance in accordance with modern methods so as to secure a fair return of the capital they have invested in land at its present valuation. These facts account, in part, for the offering for sale of some of the most productive and highly improved farm lands in Montana.

The Northern Pacific Railroad Company, received very extensive grants of land on both sides of the main line and still owns a very large acreage. For information concerning these lands inquiry should be made of the Land Commissioner of the Northern Pacific Railway, at St. Paul, Minn.

The State of Montana was granted two sections in every township for the support of public schools, and received other large grants for public institutions. No State land can be sold at private sale, for less than its appraised price, nor in any case for less than $10 an acre. The manner in which lands in Carey Act projects are disposed of has been set forth at another place. At times, of which notice is given, lands are offered at public sale in the county in which they are located, having previously been appraised. If there is no offer to buy the lands at the price the State has fixed as their minimum value they are then subject to lease. Hundreds of thousands of acres are under lease and yield a large revenue. Information concerning State lands will be furnished upon application to the Register of the State Land Office, Helena, Montana.

Lands belonging to the government, unless reserved, are subject to entry under the public land laws. The methods of acquiring mineral, coal, and desert lands, are set forth in circulars that may be obtained at the General Land Office. Lands within reclamation projects may only be secured by complying with the regulations made under authority of the national irrigation law.

YESTERDAY.
TO DAY.
TOMORROW.

Special acts relate to certain ceded lands within Indian reservations. The homestead law, however, is the one under which the public lands of Montana are being rapidly taken by settlers. The usual homestead is limited to 160 acres; but under the act approved February 19, 1909, providing for an enlarged homestead, 320 acres may be embraced in a claim if the land has been designated as of the character to which the act applies. The first section provides for the making of homestead entry for an area of 320 acres of non-mineral, non-timbered, non-irrigable public land in Montana and certain other states. The term "non-irrigable" is construed to mean land which, as a rule, lacks sufficient rainfall to produce agricultural crops without the necessity of resorting to unusual methods of cultivation, such as the system known as dry farming, and for which there is no known source of water supply from which such land may be successfully irrigated at a reasonable cost. Lists designating the lands subject to entry under the act are sent to the various land offices, and no entry can be allowed until such lists are received. This law is general application throughout that portion of Montana lying east of the continental divide, lists having already been received at the offices covering over 26,000,000 acres. Lands entered must be reasonably compact in form and in no event exceed one and one-half miles in length. The fees shall be the same as those now required to be paid under the homestead law, the commissions being determined by the area of land embraced in the entry. Provision is also made that an additional entry of contiguous lands in amount sufficient to make the homestead claim embrace 320 acres may be made by an entryman who has not made final proof. The intending settler is advised to write to Commissioner of the General Land Office at Washington, D. C., for a copy of the circular defining the manner in which lands can be obtained under the homestead law.

All business pertaining to the public lands must be transacted through the United States Land Office in the district where the land is located. Records of all entries and township plats and tract books can be consulted at the United States Land Office at the following places, where information will be furnished as to the manner of obtaining public land: Billings, Bozeman, Glasgow, Great Falls, Havre, Helena, Kalispell, Lewistown, Miles City and Missoula. When it is not convenient for the land seeker to visit the land office he may sometimes learn what tracts are vacant by consulting the nearest United States Commissioner.

The following suggestions to land seekers are republished from the Eleventh Biennial Report of the Montana Bureau of Agriculture, Labor, and Industry.

Homesteading.

The questions most persistently asked are, "Where are the public lands of Montana located, and how can one obtain them?"

In most instances a land map is also requested. Inquirers should understand first of all that maps of all the unoccupied land are to be consulted only in United States Land Offices, and that the primary requisite for making a location on any Government land is a personal inspection of the tract desired, which must be properly described when the location is made. There is public land in every county in

Montana, but it is not all suitable for cultivation. As a preliminary it is often advisable that intending settlers in a community delegate one of their number to make the trip of inspection, all contributing to defray the expense. In this manner much information may be gained and some time saved. Later the individuals of the party may make personal visits to the land, thus qualifying themselves to make the proper affidavits at the land office.

The many pamphlets issued by the railroads and various local districts, together with the reports circulated by the state, give comprehensive ideas of the attractions and advantages afforded and may be relied upon as trustworthy. After these have been carefully studied there comes the necessity of making a choice as to what part of the state is to be selected for the new home. And just here it is well to remember that Montana is the third largest state in the Union, having an average length from east to west of 535 miles, while from north to south it measures 275 miles. In this immense area there is included nearly every variety of soil and climate, as well

First Season on a Homestead.

as a diversity of occupation which includes practically every avenue of human endeavor except that of extensive manufacturing.

Information as to whether a particular tract of land is subject to entry may be obtained from the register or receiver of the land district in which the tract is located either through verbal or written inquiry but these officers must not be expected to give information as to the character and quality of unentered land or to furnish extended lists of lands subject to entry, except through plats and diagrams which they are authorized to make and sell.

The unappropriated and unsurveyed public lands of Montana July 1, 1911 were 32,030,646 acres; 15,283,718 acres were surveyed and 16,746,928 unsurveyed. Many townships have been surveyed during the year and a large body of land, estimated to amount to 340,000 acres that had been withdrawn under the reclamation law has been restored to entry. This tract is in the northern part of the state near Cut Bank, and information concerning it may be had on application to the Great Falls land office or to the Commissioner of the General Land Office at Washington. From

time to time smaller tracts that have been withdrawn are restored to entry; and in national forests are many tracts suitable for farming on which claims may be filed under the law relating to homesteads within forest reservations. The unappropriated acres of public lands in Montana July 1, 1908 were 46,532,440, and on July 1, 1911, 32,030,646 acres. In the three last fiscal years 14,501,794 acres of public land have been appropriated, by far the greatest part under the homestead law.

The manner of procedure to acquire lands under the homestead law is fully explained in "Suggestions to Homesteaders," a circular of the General Land office, that is printed as an appendix to this volume.

Many tracts acquired a few years ago as homesteads are worth as farming lands from twenty to one hundred dollars an acre. There is danger in delaying the quest for a claim. Standing within sight of orchards that could not be bought for one thousand dollars an acre a visitor told the following sad tale, says the Kalispell Inter-Lake:

A man from a middle western state came in yesterday morning and was looking for homestead land. When he found that the homestead land was all gone, except on the reservation, he shook his head sadly. "I'm too late, I guess," he said, "I should have come twenty years ago when Chris Prestbye wrote from here urging me to come. I've been getting ready ever since, but I put it off fifteen years or so too long. I didn't know what I was missing, for I couldn't believe there was such a country as this out here."

Unappropriated Public Land in Montana.

Land district and county.	Area unappropriated and unreserved.			Brief description of character of unappropriated and unreserved land.
	Surveyed	Unsurveyed	Total	
Billings:	Acres.	Acres.	Acres.	
Carbon	336,090	69,120	405,210	The general character of these lands is grazing, dry farming, timber, and stone and coal.
Musselshell	73,019	806	73,825	
Rosebud	397,602	165,120	562,722	
Yellowstone	459,351	460,800	920,151	
Total	1,266,062	695,846	1,961,908	
Bozeman:				
Broadwater	24,313	12,160	36,473	Principally arid.
Carbon	102,316	10,880	113,196	One-third good farming land; two-thirds mountainous.
Gallatin	48,507	11,139	59,646	One-fourth good farm land; three-fourths mountainous.
Jefferson	39,646	8,723	48,369	Principally arid.
Madison	137,770	112,682	250,452	One-fourth arid; three-fourths mountainous.
Park	92,499	1,742	94,241	One-third good farm land; two-thirds arid and mountainous.
Sweet Grass	382,802	.....	382,802	Grazing and mountainous.
Yellowstone	33,341	.....	33,341	Arid and mountainous.
Total	861,194	157,326	1,018,520	
Glasgow:				
Dawson	168,900	1,102,651	1,271,551	Grazing and farming.
Valley	2,366,735	2,746,287	5,113,022	Agricultural and grazing.
Total	2,535,635	3,848,938	6,384,573	
Great Falls:				
Cascade	92,980	69,060	162,040	Grazing and agricultural.
Chouteau	443,520	12,960	456,480	Do.
Fergus	1,640	15,360	17,000	Broken, grazing land.
Lewis and Clark	22,688	26,240	48,928	Mountainous and agricultural.
Teton	643,200	72,603	715,803	Agricultural and grazing.
Total	1,204,028	196,223	1,400,251	

Unappropriated Public Land in Montana.—(Continued).

Land district and county.	Area unappropriated and unreserved.			Brief description of character of unappropriated and unreserved land.
	Surveyed	Unsurveyed	Total	
Havre:				
Chouteau	1,692,680	2,009,305	3,701,985	Mountainous, grazing, agricultural.
Helena:				
Beaverhead	286,536	224,701	511,237	Mountainous and grazing.
Broadwater	97,402	87,785	185,187	Mountainous and agricultural.
Cascade	13,682	14,133	27,815	Grazing and agricultural.
Deer Lodge	43,102	18,809	61,911	Mountainous, some agricultural.
Gallatin	6,728		6,728	Mountainous.
Granite	85,530	61,709	147,239	Do.
Jefferson	2,259	180,835	183,094	Mountainous, grazing, agricultural.
Lewis and Clark	838,377	108,333	946,710	Do.
Madison	348,944	617,468	966,412	Do.
Meagher	274,137	70,030	344,167	Do.
Park	6,336	20,424	26,760	Do.
Powell	124,566	225,900	350,466	Mountainous, some agricultural.
Silverbow	90,419	16,299	106,718	Do.
Sweet Grass	9,067		9,067	Do.
Teton	24,732	75,038	109,770	Do.
Total	2,261,817	1,721,464	3,983,281	
Kalispell:				
Flathead	133,252	960	134,212	Valleys, mountainous, timber, grazing.
Lincoln	3,785		3,785	Mountainous, timberland.
Sanders	49,788		49,788	Agricultural, timber, valleys, and mountainous.
Total	186,825	960	187,785	
Lewistown:				
Chouteau	79,608	17,234	96,842	Broken, grazing.
Dawson	210,661	319,500	530,161	Do.
Fergus	910,203	1,012,000	1,922,203	Grazing, farming timber and mountainous.
Meagher	27,607	31,140	58,747	Farming and grazing.
Musselshell	309,741	56,750	366,491	Do.
Rosebud	13,760	130,450	144,210	Broken, grazing.
Sweet Grass	40,494		40,494	Farming and grazing.
Total	1,592,074	1,567,074	3,159,148	
Miles City:				
Custer	1,636,002	2,339,395	3,975,397	Grazing and agricultural.
Dawson	890,502	2,252,059	3,142,561	Do.
Rosebud	1,001,799	416,242	1,418,041	Do.
Total	3,528,303	5,007,696	8,535,999	
Missoula:				
Beaverhead	2,608	60,014	62,622	Arid and grazing.
Granite	26,808	13,365	41,173	Mountainous, timber, mineral.
Missoula	95,709	1,333,538	1,429,247	Small valleys, mountains, timber, and mineral.
Powell	9,671	19,320	28,991	Mountains, timber, grazing, mineral.
Ravalli	1,357	97,654	99,011	Do.
Sanders	18,947	18,205	37,152	Agricultural, timber, mineral, mountainous.
Total	155,100	1,542,096	1,697,196	
State total	15,283,718	16,746,928	32,030,646	

The word arid is used in a technical sense and applies to lands where dry farming is very successful. In its literal sense there are no lands in Montana that the word "arid" describes.

The privilege of obtaining a piece of fertile farm land in Montana free, under the homestead law or, at low price by purchase, is a valuable one. The task, however, of making a farm out of raw land is not an easy one, and Montana is no place for the idler, the penniless, the feeble in will or in body. The rewards that result from earnest work in the intelligent cultivation of the soil are greater than elsewhere, but to turn raw land into a producing farm requires some capital. The new settler will need a

house to live in, will have to put up fences, dig a well, build a barn, plow at least a part of his farm, procure seed, and provide food for himself, his family, and his live stock until after the first harvest. Settlers are helpful to each other, and though sometimes, money may be gained by working in the neighborhood this is not to be relied upon as a source of income, and the settler should come prepared to start a farm and to maintain himself without income from the land for the period of one year. He cannot mortgage a homestead.

Inquiries have been made by the Montana Agricultural Experiment Station regarding the amount of money the settler ought to have to meet the demands upon him when taking up an unirrigated farm. Seventy farmers were questioned, and the amounts mentioned by them ranged from $500 to $6,500 with an average of approximately $1,000 as the minimum

Beginning a Home.

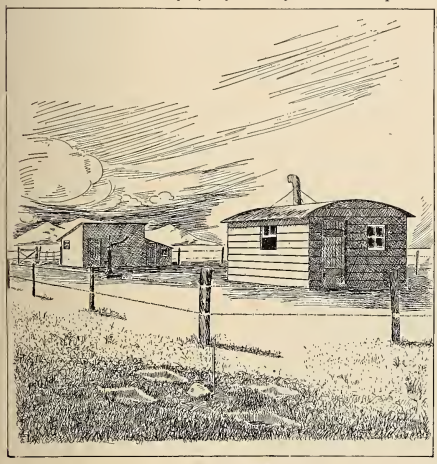
amount necessary to properly start an average unirrigated farm homestead. Much depends upon the man; but no one is urged to come to Montana to engage in farming who is not able to provide for his support until after the first harvest.

Usually the land is in condition to plow without expense for clearing. Where there are no springs or streams water for domestic purposes is found at a reasonable depth in wells. No statement as to the depth a well must be driven to reach water can be made that would apply to all parts of the state. Perhaps the country near Havre, Chouteau County, represents an average condition; and the Havre Plaindealer names twelve new settlers who recently dug wells and found excellent water at depths ranging from eighteen to sixty feet.

There is little wood for fuel in the prairie region but coal is cheap and abundant. The mountain regions are well timbered, and fire wood for

domestic purposes may be obtained in the forest reserves by complying with the easy conditions imposed.

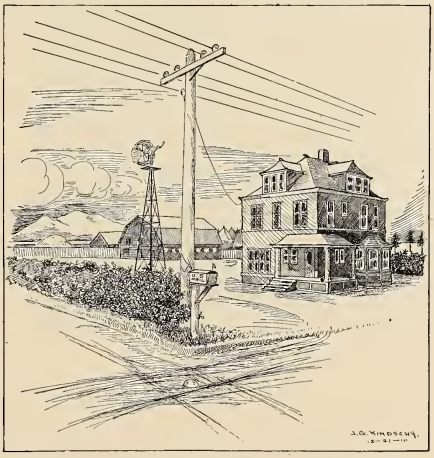
Prices of articles needed on the farm are not much, if any, higher than in other western states, with the cost of transportation added. The circular of the Huntley project says on this point:



The Old Home

Lumber and other materials used for home building are: Fence posts cost 15 cents each or can be contracted for at still cheaper prices. Rough pine and fir lumber range in price from $22 to $30 per 1,000 feet. The cost of other materials are: Flooring, $26 per 1,000 feet fence wire, $3.75 per 100 pounds; shingles, $4 per 1,000; lath, $5.50 to $6.50 per 1,000; lime, $2.50 per barrel; building paper, $1.50 per roll; cement, 80c a sack; pressed brick, $17.50 per 1,000; nails, $4 per keg. The cost of other necessities are: Flour, $3.50 per 100 pounds; sugar, $6 per 100 pounds; eggs 30 cents per dozen; butter, 35 cents per pound; beef, 15 to 18 cents per pound; hay, alfalfa, $5 to $10, timothy, $14 per ton; grain, $1.50 per 100 pounds; potatoes, $1.50 per 100 pounds; seed potatoes, 75c a bushel. Mower, $25 to $50; plows, $14 to $20; farm wagons, $100; double harness, $40.

Those who wish to visit the state and to learn by personal observation of the opportunities it offers will find that the railroads sell at reduced rates tickets for home-seekers and for emigrants' moveables, and they should bear in mind that the railroads follow the routes best adapted for easy grades and that it is often necessary to get up on the bench lands away from the tracks to get a just idea of the topography of the coutnry.



The New Home.

VALUE OF THE LAND.

Advantages for Settlers—Instances of Success—Reasons Why Samuel G. Blythe Bought Land in Montana.

Montana desires new settlers to till the fertile, raw, farm lands now idle, and wishes to make known, without exaggeration, to all that are seeking information about undeveloped regions the many advantages it possesses. The new comer finds here all the conveniences of and advanced civilization. Montana has superior advantages in the quantitl and quality of vacant land; in excellence of soil; in climate; in nearness to markets; in roads, bridges, railroads and telephoe lines already built; in convenient trading places; in schools, social organizations and churches; a condition of civilized society that the few inhabitants of a vast territory have created in the partial development of a few of the natural resources. In other undeveloped countries these advantages are absent, and years will pass before they come itno existence. Montana, however, desires no settler who will lessen the high character of its citizenship, and the invitation extended is to the man who has the enterprise and ability to become the pioneer of today, the man who turns raw land into a farm, waste land into a home.

Gibson Ranch Near Great Falls.

Authorities of the highest character are responsible for the facts stated in this volume; the Weather Bureau, the Department of Agriculture, and

the Montana Agricultural Experiment Station, have been drawn upon for statistics that have been given in much detail for the information of all who may be interested, and particularly that they may be compared with similar statistics that are—or ought to be—furnished to homeseekers by other states and provinces that have large areas of unoccupied land to which they are seeking to attract settlers.

The statistics should be persuasive enough to induce the homeseeker to visit the state; to observe the country; to get acquainted with the people; to gain personal knowledge of the weather conditions; to talk with those whose labor is enriching themselves and advancing the state; to behold fields of grain such as he cannot see in his own state, whatever it may be; to count the new farms, and dwellings, and elevators and villages that bear witness to the wonderful development that is going on; but if a visit of inspection is not possible the industrious man who wants a better chance than he has where he now lives, who has the determination to succeed, values the opportunity to do so, and has sufficient means to start a farm and to carry him through the first year, will make haste to come to Montana while it is still in the early stage of agricultural development. Millions of free and cheap lands are now waiting for him. How long will they remain unoccupied when their value becomes known?

The states of the Mississippi Valley lead the United States in agricultural production and the table given below compiled from statistics in the Year Books of the Department of Agriculture compares the yields of their principal crops for a ten year period with the yields of the same crops in Montana for a like period:

YIELDS OF CROPS IN LEADING FARMING STATES FOR TEN YEARS AND FOR 1910.

Crop.	Wheat.		Oats.		Potatoes.		Hay.	
STATE.	Bushels per acre, 1910.	Annual average, 1901–1910.	Bushels per acre, 1910.	Annual average, 1901–1910.	Bushels per acre, 1910.	Annual average, 1901–1910.	Tons per acre, 1910.	Tons per acre, annual average 1901–1910.
Ohio	16.2	15.9	37.2	33.2	82	84	1.39	1.41
Indiana	15.6	15.2	35.4	29.2	84	79	1.30	1.37
Illinois	15.0	15.7	38.0	31.2	75	83	1.33	1.35
Michigan	18.0	15.5	34.0	31.3	105	89	1.30	1.34
Wisconsin	19.2	16.9	29.8	33.1	95	91	1.90	1.55
Minnesota	16.0	13.5	28.7	32.1	61	86	1.00	1.65
Iowa	21.0	16.1	37.8	30.5	72	82	1.05	1.52
Missouri	13.8	14.5	33.6	24.0	86	81	1.30	1.28
North Dakota	5.0	12.1	7.0	29.4	41	93	.55	1.35
South Dakota	12.8	12.6	22.0	31.7	44	80	.80	1.36
Nebraska	16.1	17.9	28.0	27.6	60	82	1.00	1.51
Kansas	14.0	13.6	33.3	24.5	57	74	1.15	1.39
United States	14.1	14.3	31.9	29.6	94	93	1.33	1.45
Montana	22.0	25.8	38.0	43.2	120	149	1.40	1.78

Prof. F. S. Cooley, Superintendent of Farmers Institutes, speaking of land values in Montana, says:

Unirrigated wheat lands that will produce thirty to forty bushels of wheat every two years—and there are thousands of acres that may be made to produce fifty bushels if properly handled—will pay 10 per cent on $70 to $110 per acre; and what-

ever difference there is between this and the purchase prices may be credited to the purchase as profit.

James J. Hill, the railroad builder, said at the Montana State Fair of 1911 that Montana had advanced in two years as much agriculturlly as he had expected it to advance in ten years, and continued:

"I have seen a great many fairs, a great many agricultural exhibits, but I have never any where seen an exhibit that was so uniformly good in every particular as I saw in the Montana State fair exhibit building.

"We used to think that Montana was a gold state; a mineral state; later on they tacked on the cows and the sheep, but I will tell you that Montana is coming to her own and she is going to hold her head high among the agricultural states of the Union. You have at least from thirty to thirty-five million acres of as good land as the sun shines on, and if anybody does not realize the truth of that, let him go through those buildings here and see what you have to show for it.

"You cannot get away from it, and I do not believe there is a state in this Union that can make as good an exhibit on so many agricultural products as you have today."

Stacking Hay.

Mr. William Rockefeller traveled through central Montana during the summer, and a conversation had with him at Mammoth Hot Springs, Wyoming, is reported, in part, as follows:

Mr. Rockefeller told me that he had never realized how wonderful Montana actually is, its immeasurable possibilities of development. All his life he had been laboring under the delusion that it was a waste of mountains in which men dug for mineral. A more enthusiastic man I never met. He declared that Montana is potentially the greatest agricultural state in the Union; it only needs development.

Mr. M. Fitch, a business man of Denver, after a journey through the northern part of Montana, said last fall at Great Falls:

"The yield of the lands that are not irrigated in this country are the most remarkable I ever saw. I come from a state where they boost land values for just what they are worth and for some land that does not raise half what I have seen up here more than five times as much is asked. All of the land on which these crops are being raised was nothing more than common grazing land until recently, the real value of the soil was unknown."

The Sioux City (Iowa) Tribune of September 12, 1911, printed an

interesting article by Mr. J. W. Johnson, who was visiting in Lewistown, from which the following extracts are taken:

"A young man wanting to start and to grow into ownership of land has more chance for success here in Montana now because there is less competition between men for the opportunities. Wheat land is easy to get, low priced, because there is so much land and so few people and because the wheat producing is only in the beginning. Everything is moving here. It is a time of the beginning of things. There is activity in town and country. The railroads now have the new idea that Montana is to be peopled with wheat farmers and that stock raising is to be carried on more than ever by the many rather than by the few. I like this idea of a free-for-all chance in a great state like this, that has so much room for the beginning of things. It is everybody's world and opportunities ought to be opened for every man whose ears are quick enough to hear it knocking at his door."

The experience of David Bricker of Moore, Fergus county, will be repeated by many who do not delay their coming until the country is settled up. Mr. Bricker who came from Missouri to Montana, located a 160 acre homestead in Fergus County in 1902; after paying filing fees he had only thirty-five dollars left, but he stayed with the claim and in 1910 he sold it for one hundred dollars an acre.

Not many years ago Rev. John G. Clark, a minister of the gospel not possessed of worldly wealth was compelled by the failure of his health to withdraw from the labors of his profession. He was advised to "go back to the soil" and in his search for a place to earn a living he found a 40 acre tract of government land near Fromberg, Carbon county, that was vacant. Mr. Clark decided to file on this small parcel of land and to try to make a living on it as a fruit orchard; but a serious difficulty confronted him; he did not have the few dollars required to pay the filing fees at the land office. He went to the county seat, friends advanced the sum needed and he filed his claim. The neighbors regarded his undertaking as a foolish one, but he persisted, worked hard, planted an orchard of apple trees, tended them carefully, saw them grow and thrive, and finally develop into one of the finest orchards in the United States. Mr. Clark's orchard is said to net him $15,000 a year and he has refused an offer of $1,000 an acre for it.

The following account of the success of a homesteader in raising vegetables on an unirrigated tract is republished from the Judith Gap Journal:

"One of the first homesteaders in the Hedgesville district was George Eberhart, and probably no other individual in central Montana has received so many compliments on his first season's agricultural work as has the above mentioned gentleman. His place is located about four miles southwest of Hedgesville, and has been visited by scores of interested parties, who always returned marveling at the results attained by the persevering homesteader. Mr. Eberhart believes in doing his work thoroughly, and being without funds after building a cabin and barn, he spaded two acres of land and later hired ten acres broken, sowing the same to little patches of cereals and garden stuff. His claim lies on the top of a high bench, and at present he has no well and irrigation by any system is impossible. However, he was enthusiastic from the start, and his enthusiasm and the results of scientific farming have instilled the belief in hundreds of persons that profitable returns can be secured even during the most unfavorable seasons if the approved methods of conserving

moisture will be practiced. Mr. Eberhart this year raised good paying cereal crops.

His garden was the wonder of the district. From a two acre patch of onions he sold nearly $100 worth of this popular vegetable, and still has many left. His green corn was on the Hedgesville market nearly a month ago. Cucumbers, tomatoes, beets, parsnips, oyster plants, radishes, lettuce, potatoes and many other vegetables were raised in abundance without a drop of water other than furnished by nature. We quote some remarks made by distinguished persons who visited the place. "Anyone interested, directly or indirectly, in farming in this district should visit Mr. Eberhart's place. No matter how much the visitor may know of farming, he can't help but learn something." "I have traveled all over Montana, and have visited all the experimental stations in the western and central western states and at no other place have I seen garden produce raised without irrigation that equals

Timothy Seed in Shock, Park County.

Mr. Eberhart's. In fact, not even the irrigated gardens excelled his." "It's wonderful—right on top of a high bench, not a drop of water in sight—the way that man Eberhart makes stuff grow during this unusually dry year." Remarks could be continued by the dozen, but the above will suffice to show that the gentleman in question has produced results that have been astounding to those unacquainted with the possibilities of scientific farming.

Samuel G. Blythe, the noted writer of "Who's Who and Why" in the Saturday Evening Post, has bought land in Montana and become a citizen of the state. At the Montana State Fair of 1911 Mr. Blythe explained why he invested in Montana. He said, in part:

Now citizens, of Montana, I want to talk to you as a citizen of Montana, which I am. I have declared in on Montana, whether you want me or not. And why? Not for sentimental reasons. Not because any of my people were born here or lived here. The reasons for my becoming a citizen of Montana are hard, business reasons.

In the past 25 years I have crossed and criss-crossed the United States many times. I have been in every nook and corner of every state and every territory. I am a writer, a reporter, and it is my business to see things. I have investigated all

37,000 Bushels of Wheat from one Farm in Fergus County.

sorts of political, social and economic situations. In that 25 years I have been laboriously accumulating a little money.

Naturally, my investment of that money was predicated on what I had found out in all parts of the United States. I invested in Montana, in Montana land. Why? Because after looking at it all I concluded that within the next 10 or 15 years Montana is destined to be one of the greatest, and probably the greatest, state in the Union, if you people do your part, as I think you will. Now, that is the reason I am a citizen of Montana. I want to be in on this development.

This brings me to the readjustment proposition. With your mineral assets fixed, or practically so, and your grazing assets and your timber assets practically fixed, also, there now comes a new condition.

Dry Land Wheat, Gallatin County.

You have here in Montana the greatest potential agricultural country on earth. You haven't made a dent in your plow land yet. There lies your future prosperity. There lies your wealth and your power and your influence as a unit of this republic.

For years you have gone along raising cattle and digging mines and all that. Now the period of readjustment is at hand. You must develop your agricultural resources. Hundreds of millions of dollars are under your feet, waiting to be plowed up. You must turn your attention to the soil.

That is the new condition that faces you citizens of Montana. You know it. Of course you do. But let me go a little further with this statement. What makes a state? Men and women. You have everything material. Now, you need human beings. You need men and women—people.

Put 200,000 or 300,000 more people in this great state, set them to plowing the land, and in less than ten years the money derived from all your mines and all your cattle and sheep will be as pennies against double eagles. The wealth of the world is in your soil, waiting to be taken out.

GRAZING LANDS AND THE LIVE STOCK INDUSTRY.

Area of Grazing Lands—Favorable Environment for All Animals—Census Statistics of Livestock—Industry Adjusting Itself to Decrease of Range.

The second class into which the lands of Montana are divided, for the purpose of description, are the grazing lands that have been estimated to be 30,000,000 acres. In this classification have been put lands, other than mountainous, that are too rough to be farmed with the usual machinery.

The Grazing Lands.

The grazing lands support the live stock industry which has been next in importance to mining. It grew and prospered as the years went by until the free and open range became occupied, even crowded in some localities. The occupation by settlers of government lands and the creation of forest reserves has greatly lessened the range. However, the future success of the live stock industry in Montana is assured by the vast area of land that is only adapted for grazing and by the natural conditions that have made the industry so wonderfully successful since its establishment, viz., the excellence of the climate and water, the nutritious quality of the native grasses, and the freedom from diseases. The industry began with the raising of horses and cattle, which was followed by the introduction of sheep into the territory; and this branch of live stock industry grew until Montana gained first rank among the states for the production of wool and the number of sheep owned.

All Animals Flourish in Montana.

Horses raised in Montana are noted for their lung power, endurance, and courage. Many noted race horses have been born in the State—King Brook who made a California trotting record in 1911, is a recent example. Breeding establishments turn out numbers of running, trotting, and pacing horses every year, and also many fine driving horses and saddle animals. A great improvement in the past ten years in the size and strength of the work horses has been caused by the importation of blooded stallions of the most approved breeds.

Cattle flourish on the native grasses of Montana as they do nowhere else. They do not require much winter feeding. Steers from the range have brought top prices in the markets of Chicago. The herds have been bred up and fine types of the best grades of cattle are to be found in every county. Cattle are bought in other states and brought into Montana and fattened for the market.

Sheep are usually of the grades best adapted for the range and for the production of wool, and no expense has been spared by the flockmasters to bring their flocks up to the highest possible grades. The raising of mutton varieties has also begun and will increase in importance as the profits to

be derived from the business are more fully understood. Already the business of fattening lambs and sheep has assumed large proportions in sections where alfalfa is abundantly grown. This business combines the advantage of farming and manufacturing as it is, in effect, turning the raw material—grass and grain—into the manufactured product—the fattened steer, sheep or lamb—on the farm.

King Brook—Pacific Coast Trotting Champion, Born in Madison County, Montana.

The superiority of Montana's grasses, water, and climate for all grazing animals, shown in the average weight of a fleece of wool, is demonstrated in a remarkable manner in the case of Angora goats.

Some years ago a few Angora goats were brought into the state and there was much discussion of their merits as profitable fleece producers and as clearers of brush land; but the industry did not gain a good start and not much has been heard of it for the past few years. Interest was revived last summer by the shipment by the Northern Angora Goat and Livestock Company of 17 select goats which were ordered by Carl Hagenback, of Hamburg, Germany. They will be used for exposition purposes and as foundation for a flock. The fact that this world famous animal owner selected Montana goats as the best obtainable in the world is conclusive proof of their superiority.

John W. Fulton is the manager of the ranch near Marysville from which these goats were shipped. The average clip of an Angora goat is

about 3½ pounds, but these Montana goats shear from 8 to 20 pounds, a 15 pound clip being not uncommon. The average price of goat fleece, the mohair of commerce, is about 50 cents a pound, while the price brought by the Fulton clip ranges from $2.50 to $6.50 a pound. The difference is caused by the difference in length of the fibre. Dr. Knowles has in his possession a strand of fleece 14 inches long from a yearling. The superior quality of this flock of Angoras is due to careful breeding, all inferior stock having been eliminated, and to an environment so favorable that this animal has reached the highest stage of perfection in Montana. The air, the water, and the grass, have made the animal to grow larger than the original stock, and the fleece has increased in weight and length to a reasonable extent. The yearly increase is over 100 per cent; and the flock, which, now numbers about 500, is strong and healthy.

Dr. M. E. Knowles, the State Veterinarian, is much pleased at the success that has attended goat breeding in Montana, which, he says, demonstrates what he always predicted, both in regard to Angora goats and other kinds of livestock. "European stockmen are coming back to America to get new blood and individuality for their stock," Dr. Knowles has said. "It is only necessary for the Montana man to use judgment in the matter of breeding along best lines for this state to lead the world in the production of high grade horses, cattle, and sheep, as well as goats. The conditions here are the best in the world for livestock; but brains must be used, imperfections must be breeded out, and perfection breeded to. When this practice shall be followed scientifically Montana stockmen will have the world for their market."

In 1910 there were shipped out of the state 243,662 head of cattle; 218,183 went to eastern, and 25,475 to western, markets.

According to the census of 1910 the farms of Montana were 26,213. Sheep or lambs were found on 2,269 farms. The number of sheep and lambs of all classes was 5,372,639 and of wool producing sheep 4,978,463. Montana stands first among the states in number of sheep and in quantity of wool produced.

For years since 1900 the number of sheep and pounds of wool produced are given in the following table that was compiled from statistics published by the Department of Agriculture.

Sheep and Wool—1900 to 1910.

YEAR.	1900	1901	1902	1903	1904	1905
Sheep	3,717,160	4,526,517	5,081,000	5,100,000	5,576,000	5,200,000
Wool	26,020,120	30,553,990	35,567,000	30,600,000	37,773,000	37,700,000

YEAR.	1906	1907	1908	1909	1910
Sheep	4,940,000	4,600,000	4,600,000	5,000,000	4,800,000
Wool	35,815,000	30,820,000	32,200,000	35,000,000	33,600,000

The assessed valuation of live stock in Montana for the past five years

Some Assets of a Ranch.

was as follows: 1907—$32,531,152; 1908—$33,018,800; 1909—$36,864,680; 1910—$37,123,178; and 1911—$35,139,471. The slight decrease is due to the sale of range stock.

The Census Bureau has issued a preliminary report of statistics on domestic animals, poultry and bees on farms and ranges in Montana that does not give the figures for the cities and towns. It is as follows:

Census Report on Domestic Animals, Poultry and Bees on Farms and Ranges in 1910.

The aggregate value of all domestic animals, poultry, and bees in 1910 was reported as $85,571,000. as compared with $52,029,000 in 1900, the amount of increase being $33,542,000. and the rate 64.5 per cent.

The total value of the domestic animals was reported as $84,911,000 in 1910, as against $51,724,000 in 1900; the increase amounting to $33,187,000, of 64.2 per cent

The poultry were valued at $628,400 in 1910, as compared with $296,800 in 1900, the gain being $331,600, or 111.7 per cent.

The bees were valued at $32,100 in 1910, and $8,100 in 1900, the increase amounting to $24,000, or 294.5 per cent.

In 1910 the three classes, sheep and lambs, cattle, and horses and colts, were of almost equal value, with sheep and lambs slightly in the lead, while in 1900, cattle had a greater value than any other class, being nearly half the total value of all domestic animals at that time.

The total value of sheep and lambs in 1910 was $28,999,000, as compared with $18,165,000 in 1900, the increase amounting to 59.6 per cent. The total value of cattle in 1910 was $27,459,000, while in 1900 it was $25,362,000, an increase of 8.3 per cent. Next in order in 1910 were horses, with a total value of $27,071,000, as compared with $7,789,000 in 1910, the increase amounting to 247.6 per cent. Swine in 1900 were valued at $858,600, as compared with $281,400 in 1900, an increase of 205.1 per cent. The total value of mules and mule colts in 1910 was $445,300, while in 1900 it was $102,700, the increase amounting to 333.4 per cent. Asses and burros in 1910 were reported as valued at $55,200, as against $16,000 in 1900, the increase amounting to 244.7 per cent. Goats and kids in 1910 were valued at $22,400 as compared with $7,900 in 1900, an increase of 184.8 per cent.

Sheep and lambs in 1910 constituted 33.9 per cent of the value of all live stock; horses and mules, 32.1 per cent; cattle, 32.1 per cent; swine, 1 per cent; poultry, 0.7 per cent; and bees, less than one-tenth of 1 per cent.

The total number of farms in the state in 1910 was 26,213. Of these, 90.8 per cent, or 23,805, reported domestic animals; 86.9 per cent, or 22,776 reported horses or colts; 71.9 per cent, or 18,835, reported cattle; 34.9 per cent, or 9,152, reported swine; 8.6 per cent, or 2,267, reported sheep or lambs; and 4 per cent, or 1,058, reported mules or mule colts.

The total number of sheep and lambs reported for 1910 was 5,372,639. Of these, 3,050,239 were mature ewes, born before 1910, and their total value was $17,567,000, or an average of $5.80. This total value was 60.6 per cent of the total value of all sheep and lambs. Rams and wethers numbered 1,602,658, and the average value was $5.50. Spring lambs were 393,676 in number, and their average value was given as $2.15. The number of spring lambs was 12.9 per cent of the number of ewes. In addition to the above, 127 farms reported 326,066 sheep, which were not classified by age or sex, and their total value was given as $1,830,000, or an average value of $5.60.

The total number of cattle reported in 1910 was 942,604. Of these, 77,437 were dairy cows, the total value of which was over $3,403,000, and the average value $43.95. The number of farms reporting dairy cows was 16,742, or 63.9 per cent of the total number of farms in the state. On the other hand, cows not used for dairy purposes numbered 372,738, with a total value of $11,258,000, and an average value of $30.20.

These cows were reported by 8,919 farms, or 34 per cent of the total number of farms in the state. The average number of dairy cows per farm reporting was less than 5, while the average number of cows not kept for milk per farm reporting that class was about 42. Yearling heifers—that is, heifers born during the year 1909—numbered 100,773; average value, $19.50. Mature steers and bulls, born before 1909, were 170,266 in number; average value, $37.70. Yearling steers and bulls, born in 1909, numbered 90,367; average value, $21.90. The total number of spring calves, born in 1910, was 82,596, and the average value, $9.60. It may be noted that the census of 1900 showed a larger number of calves, namely, 187,533. This difference

Holstein Bull.

was due to the fact that the census of 1900 was taken as of date June 1, after all the spring calves were born, and the group 'Calves" included all cattle less than 1 year of age, so that the number and average value of calves were greater than in 1910, when the census was taken on April 15, and only "Calves born in 1910" were included in the comparative group. There were reported 48,427 cattle, not classified by age or sex, and their average value was $33,80.

The total number of horses and colts reported in 1910 was 315,387. Of these, 250,632 were classed by the census as mature horses—that is, horses born before 1909—and their value was $24,369,000, and average value $97.20. Yearling colts, which are colts born in 1909, numbered 41,439, and their average value was $43.05. Spring colts, born in 1910, were 11,702 in number, and their average value was reported as $25.20. It may be noted that 17.3 per cent of the farms of the state reported colts born in 1910. In addition to the above, 11,614 horses, not classified by age or sex, were reported, with an average value of $53.60.

The total number of mules of all ages in 1910 was 4,174, which is 1.3 per cent of the number of horses and colts. Of these, adult mules, born before 1909, numbered 3,021, and their average value was $125.90. Only 130 mule colts, born in 1910,

were reported, their average value being given as $29. There were 1,023 yearling colts, born in 1909, and their average value was $59.80.

The total number of swine in 1910 was 99,221, of which more than one-half, or 56,324, were classed as "Hogs born before 1910." The total value of these was $720,200, and the average value, $12.80. The spring pigs born in 1910 numbered 42,897, and their average value was reported as $3.20.

The summary on poultry shows that the total number of farms reporting the different kinds in 1910 was 17,629, the total number of fowls being 966,690, and the total value $628,400.

Lamb, Age 5 Months, Weight 143 Pounds.

Of the total number of farms reporting poultry, 17,629, nearly all, or 17,595, reported chickens, numbering 922,540, valued at $565,300; 3,481 reported turkeys, numbering 16,475, valued at $37,800; 1,592 reported geese, numbering 7,013, valued at 514,200; 1,630 reported ducks, numbering 8,243, valued at $7,400; 217 reported guinea fowls, numbering 633, valued at $580; 595 reported pigeons, numbering 11,736, valued at $2,900; and 12 reported peafowls, numbering 50, valued at $320.

Of the whole number of farms in the state, those returning chickens formed 67.1 per cent; turkeys, 13.3 per cent; ducks, 6.2 per cent; geese, 6.1 per cent; pigeons, 2.3 per cent; and guinea fowls, 0.8 per cent. The reported increase in the value of poultry on Montana farms in the 10 years 1900 to 1910 was 111.7 per cent; the increase in the total number of fowls, 73.7 per cent. The number of farms reporting poultry increased 7,799, and the number of fowls per farm reporting decreased from 57 to 55.

The number of farms reporting bees increased from 234 in 1900 to 795 in 1910, or 239.7 per cent. The colonies of bees on hand in 1910 showed an increase from

1,801 in 1900 to 6,313, or 250.5 per cent, and the value increased from $8,100 in 1900 to $32,100 in 1910, or 294.5 per cent.

The actual and relative number of farms reporting bees, together with the value and number of colonies, increased very materially during the decade and at about the same rates. About 3 farms in each 100 reported bees in 1910, while in 1900 they were reported by about 2 farms in each 100.

COMPARATIVE SUMMARY—VALUE OF DOMESTIC ANIMALS, POULTRY, AND BEES: 1910 AND 1900.

KIND.	1910 (Apr. 15)		1900 (June 1)		Increase.	
	Value.	Per cent distribution.	Value.	Per cent distribution.	Amount.	Per cent.
Total	$85,571,137	100.0	$52,029,058	100.0	$33,542,079	64.5
Cattle	27,458,569	32.1	25,362,016	48.7	2,096,613	8.3
Horses and colts	27,071,284	31.6	7,788,672	15.0	19,282,612	247.6
Mules and mule colts	445,278	0.5	102,741	0.2	342,537	333.4
Asses and burros	55,181	0.1	16,008	*	39,173	244.7
Swine	858,562	1.0	281,402	0.5	577,160	205.1
Sheep and lambs	28,999,239	33.9	18,165,404	34.9	10,833,835	59.6
Goats and kids	22,416	*	7,870	*	14,546	184.8
Poultry	628,436	0.7	296,806	0.6	331,630	111.7
Bees	32,112	*	8,139	*	23,973	294.5

* Less than one-tenth of 1 per cent.

SUMMARY—DOMESTIC ANIMALS—APRIL 15, 1910.

AGE AND SEX GROUP.	Farms Reporting.		Animals.		
	Number.	Per-cent of all farms.	Number.	Value.	Average value.
Total	23,805	90.8	.....	$84,910,589	.....
Cattle	18,835	71.9	942,604	27,458,629	.....
Dairy cows (cows and heifers kept for milk, born before Jan. 1, 1909)	16,742	63.9	77,437	3,403,235	$43.95
Other cows (cows and heifers not kept for milk, born before Jan. 1, 1909)	8,919	34.0	372,738	11,258,242	30.20
Heifers born in 1909	10,081	38.5	100,773	1,965,549	19.50
Calves born after Jan. 1, 1910	10,577	40.4	82,596	792,895	9.60
Steers and bulls born in 1909	6,789	25.9	90,367	1,978,319	21.89
Steers and bulls born before Jan. 1, 1909	4,934	18.8	170,266	6,422,024	37.72
Class not specified	493	1.9	48,427	1,638,365	33.83
Horses and Colts	22,776	86.9	315,387	27,071,284	.....
Mares, stallions and geldings born before January 1, 1909	22,086	84.3	250,632	24,369,344	97.23
Colts born in 1909	9,462	36.1	41,439	1,784,024	43.05
Colts born after January 1, 1910	4,533	17.3	11,702	295,073	25.22
Class not specified	553	2.1	11,614	622,843	53.63
Mules and Mule Colts	1,058	4.0	4,174	445,278	.....
Mules born before January 1, 1909	894	3.4	3,021	380,307	125.89
Mule colts born in 1909	246	0.9	1,023	61,206	59.83
Mule colts born after Jan. 1, 1910	65	0.2	130	3,765	28.96
Asses and Burros (all ages)	106	0.4	160	55,181	344.88
Swine	9,153	34.9	99,221	858,562	.....
Hogs and pigs born before Jan. 1, 1910	8,576	32.7	56,324	720,160	12.79
Pigs born after January 1, 1910	3,597	13.7	42,897	138,402	3.23
Sheep and Lambs	2,267	8.6	5,372,639	28,999,239	.....
Ewes born before January 1, 1910	1,944	7.4	3,050,239	17,567,083	5.76
Rams and wethers born before January 1, 1910	1,447	5.5	1,602,658	8,756,235	5.46
Lambs born after January 1, 1910	900	3.4	393,676	846,393	2.15
Class not specified	127	0.5	326,066	1,829,618	5.61
Goats and Kids (all ages)	176	0.7	5,045	22,416	4.44

Moving a Band of Sheep on the Range

COMPARATIVE SUMMARY—POULTRY—1910 AND 1900.

KIND.	1910 (April 15)				1900 (June 1)
	Farms reporting.		Number. of fowls.	Value.	Number. of fowls.
	Number.	Per cent of all farms.			
Total	17,629	67.3	966,690	$628,436	556,679
Chickens	17,595	67.1	922,540	565,337	531,774
Turkeys	3,481	13.3	16,475	37,804	12,637
Ducks	1,630	6.2	8,243	7,353	9,638
Geese	1,532	6.1	7,013	14,195	2,629
Guinea fowls	217	0.8	633	579	*
Pigeons	595	2.3	11,736	2,851	**
Peafowls	12	†	50	317	**

* Included with chickens. ** Not reported. † Less than one-tenth of 1 per cent.

Decrease of Range.

The range is still of vast extent, but it is no longer profitable to use lands that are fit for farms as wild pastures. New settlers have homesteaded and fenced thousands of acres of public lands upon which thousands of cattle and sheep used to feed. The open, free, range has become restricted, and many large ranches have been divided into farms and sold. The range stock industry was based on the free use of land not owned by the owner of the cattle or sheep that fed on it and has to give way when the same land is sought as homes by those who will till the soil and rear people where only cattle and sheep have been raised. Parts of Montana are going through the experience that attends the change from one industrial condition to another, the evolution of a country from a pastoral to an agricultural stage of development, a change that is the mark of an increasing population and of an advancing civilization.

The live stock industry will adjust itself to the new conditions; and it is creditable both to the stockman and the settler that few conflicts have arisen between them during this period of change. Some stockmen accept the changed conditions with equanimity. In an address delivered at the annual meeting of the Montana Wool Growers Association, held at Miles City in April, 1911, B. C. White a leading sheepman of Fergus County, according to the Miles City Independent, said:

"Ten years ago we had $1,250,000 of wool sales in my county. Judith Basin has been the paradise for the sheep grower, but the sheepmen are going out fast—the country is being settled up by farmers. We can fight the foot and mouth disease and the 'scab,' but we cannot successfully antagonize the dry land farmer, at least we cannot fight him in Fergus County. On my old range there are now more than sixty farmers, raising over sixty bushels of Turkey Red wheat to the acre and if they sell out at all they get from fifty dollars upwards per acre for their land. That land is too costly for sheep raising, by far, sheep raisers are being forced out of the business. That's all there is to it.

"I bought 160 acres four years ago for two dollars and I could sell out now for fifty dollars per acre. I would not restore the old paradise for sheepmen up in the Judith Basin if I could. I believe agriculture is much better calculated to develop the country than wool growing, and so it is that I am now a dry land farmer myself, and my present slogan is 'Turkey Red Wheat'—a sentiment which was applaunded by the convention."

THE TREASURE VAULT OF THE TREASURE STATE.

The Mountain Area—The Mining Industry—Coal Production—The Forests —Hydro-electric Power—One Huge Recreation Ground—Glacier Park.

The third class into which the lands of Montana have been divided for the purposes of convenient description are the mountain lands that are

Little Beauty Falls.

estimated to be 30,000,000 acres. Mining and lumbering are the leading industries in this region. All the land is not mountainous and excellent pasture is found in many parks in the forests nad on the grass covered slopes that in some places extend from mountain summits to cultivated val-

leys. In the mountain area are also many detached tracts that are suitable for farming or for fruit growing. In the valleys and basins, some of great extent, in the mountainous parts of Montana are millions of acres of farm lands. Those in the valleys are usually irrigated and yield most prolific crops of grains, grasses, and fruits. Many of the principal cities are situated in valleys within the mountain area.

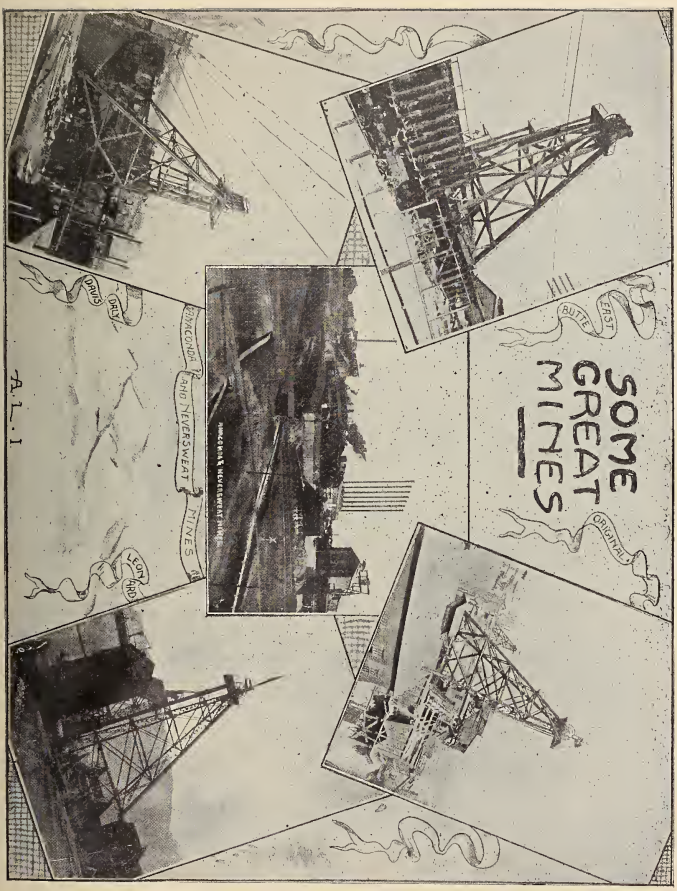
The mountain area contains also the great forests, the thermal and mineral springs, the places that attract the lovers of outdoor life, and of picturesque and grand scenery, landscape artists, fishermen, and hunters. The mountain ranges are storage places for rain and snow and yield their moisture for fertilizing the lowlands at varying periods. In Montana the waters do not run off in great floods. In the highest ranges are glaciers

Thompson Falls.

and fields of ice and snow. The snow that falls in winter melts at separate times, according to differences in altitude and shelter, and provides a steady flow of water during all the months of the year. From every mountain issue beautiful streams: "Pure, clear, cold, they come dashing from the mountains, making their way seaward with a fall unknown in lower altitudes." The fall of water in the streams made irrigation easy and many private irrigating canals were built at a low cost. The fall being great, the streams rapid, and the volume of water large, Montana is also blessed with an abundance of water power for generating electricity.

The Mining Industry.

But the greatest asset of the mountain area is the mineral wealth it contains. It is the Treasure Vault of the "Treasure State," in which are stored great quantities of gold, silver, copper, lead, zinc, coal, iron, manganese, asbestos, phosphate, gypsum, graphite, corundum, petroleum, onyx,



Great Copper Mines at Butte.

marble, granite, cement rock, and precious stones—garnets, rubies, and sapphires. It is the seat of the mining industry that has added to the worlds wealth hundreds of millions of dollars worth of precious and useful metals, and has, perhaps, as much more for future needs. Montana's mineral industry, directly or indirectly supports one third of the population, is firmly established, and has world-wide fame. The great copper mines of Butte pour out their riches every hour of every day of every month in the year; the supply of ore is ample, and the pay-roll is always working. The problem of utilizing ores carrying zinc is about to be solved. New mines are being developed in the Butte district, and an increased activity is evident in mining development throughout the state. Radersburg has become a large producer; Corbin promises to become a copper camp of importance; a gold dredge has been put to work in the Missouri river near Helena, and another near Missoula; Neihart is producing more than formerly; in the noted mineral counties old mines are being worked and new ones developed; and in the large mineralized area of Lincoln county are many prospects that promise to become mines.

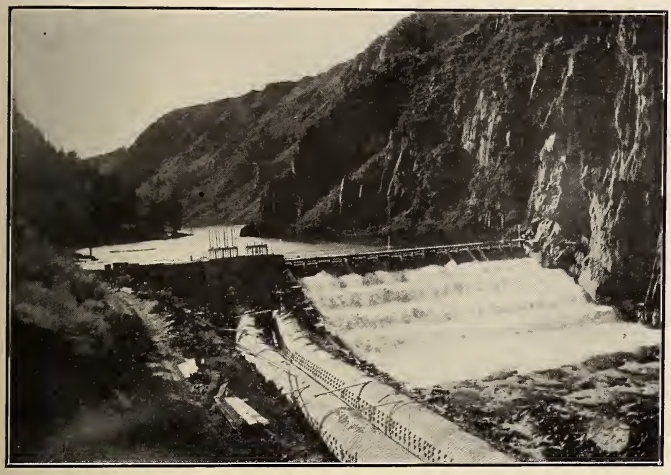
It is beyond the scope of this pamphlet to attempt a description of the vast mineralized area of Montana or to discuss the mineral industry. It may be said, however, that it is the belief of many well informed persons that the mineralized area has not been fully prospected, that new placer grounds may yet be found, and that many mines of gold, silver, and copper are waiting to be developed. Known deposits of ores carrying good values are not now producing because they are too remote from a railroad to justify freighting to a station for transportation to a smelter. Doubtless there are places not yet tried which would re-pay the large initial cost of installing dredges for the recovery of placer gold. New methods of milling ores have been discovered since the palmy days of gold and silver mining in Montana when only high grade ores were milled; and ores that were then of a value too low to be treated can now be worked at a profit. These low grade ores, these partially developed claims, these mineral districts remote from railroads, as well as mineral properties where the values near the surface have been extracted but where the depth necessary to demonstrate whether ore exists in quantity and value to make a paying mine has not been obtained—all these present alluring chances for fortune.

There is no reason to doubt the permanent greatness of the mining industry and its expansion may be confidently expected. The mineral resources of Montana, developed and undeveloped, are one of the greatest assets any country could have. Statistics of production will be found on a later page.

Coal.

The coal mines are located at some distance, as a rule, from the gold, silver or copper mines; they are near the farms of the eastern part of the state, and furnish fuel to farmers in a region that has few trees. Montana is rich in coal. The original coal supply, according to estimates made by M. R. Campbell, of the United States Geological Survey, was 303,060,000,000 tons and 0.015 per cent had been mined at the close of 1909.

Coal is mined in many counties and is a leading industry in Carbon, Cascade, and Musselshell counties. The new county of Musselshell embraces the mines that produced the coal credited to Yellowstone County in the following table:



Dam of Madison Power Company.

COAL PRODUCTION BY COUNTIES.

COUNTIES.	1909.		1910.	
Carbon	1,098,496	tons	1,197,430	tons
Cascade	996,571	"	929,595	"
Chouteau	22,816	"	22,986	"
Custer	7,355	"	3,350	"
Fergus	245,229	"	303,649	"
Gallatin	7,441	"	29,862	"
Park	117,483	"	101,269	"
Rosebud	551	"	.....	"
Valley	1,743	"	4,018	"
Yellowstone	43,994	"	378,087	"
Total	2,541,679	tons	2,970,246	tons

The Forests.

Montana is rich in timber. The forested area embraces more than 20,000,000 acres, and the state forester estimates the quantity of standing timber at fifty billion feet. In 1909 the operations of 180 mills were reported to the census office. Their output was 308,582 thousand feet, board measure. Lumbering is a leading industry in western Montana. Large mills are located at Bonner, Hamilton, Missoula, St. Regis, Somers, and Libby and smaller ones are scattered throughout the timbered districts.

Montana's forests provide wood for fuel and fencing, lumber for build-

ings, and the timbers needed in the mines. Pine, of several varieties, spruce, fir, cedar and larch are the trees of commercial importance. Cottonwod is the tree commonly found along river banks, grows to large size, and is useful for many purposes. Montana led all states in 1909 in the quantity of larch lumber produced. Boards made from larch take a beautiful polish and are suitable for decorative as well as for useful purposes. Railroad ties are an important lumber product and large plants for pickling them have been established at Paradise, Sanders county, and Somers, Flathead county.

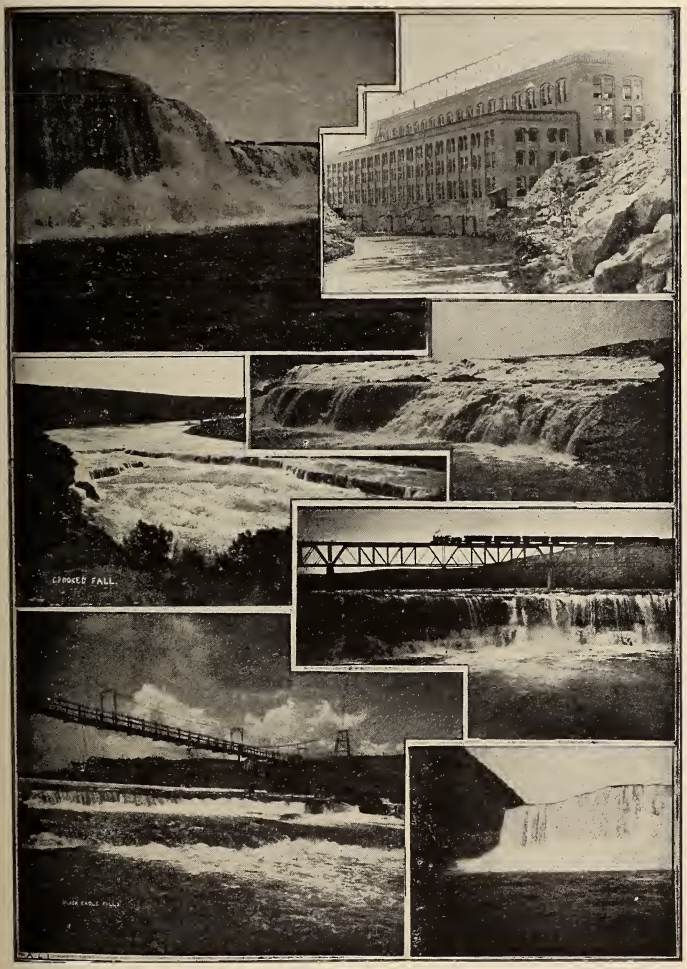
The greater part of the standing timber is within national forests and permission is readily granted for settlers to secure fire wood and poles for fences and corrals. Under certain conditions stumpage is sold; and permits are granted for grazing livestock; and the state receives a small revenue from this source. The national forests in Montana are too extensive and all lands suitable for farming and fruit growing should be restored to the public domain. A policy of conservation that prevents the development of a country is objectionable. The great extent of land that has been withdrawn from the operation of the public land laws and that will not become taxable property as long as it remains in reservation is shown in the table that follows:

ACREAGE IN NATIONAL FORESTS.

COUNTY—	Acres.	COUNTY—	Acres.
Flathead	2,810,817	Powell	608,018
Missoula	1,732,362	Jefferson	518,558
Beaverhead	1,506,680	Cascade	436,867
Ravalli	1,155,095	Sweet Grass	442,524
Madison	1,038,751	Carbon	430,720
Sanders	1,033,094	Deer Lodge	331,634
Park	923,356	Fergus	235,901
Lewis and Clark	862,167	Broadwater	226,478
Gallatin	815,019	Silver Bow	210,733
Teton	794,958	Lincoln	1,964,850
Meagher	783,458	Rosebud	121,572
Granite	693,749	Chouteau	37,504
Custer	614,401		
		Total	20,389,696

Hydro-Electric Power.

The Missouri, which with its extension the Mississippi is the longest river in the world, is formed by the junction at Three Forks, of the Jefferson, the Madison, and the Gallatin rivers and drains with its principal tributary the Yellowstone, which joins it in North Dakota a few miles east of the Montana boundary line, two-thirds of the state. The western part drains into the Columbia river through Clark's Fork of the Columbia and the Kootenai rivers. The two greatest rivers of the country have their headquarters in the Rocky Mountains of Montana. The fall from the mountain peaks that reach an elevation of 11,000 feet to altitudes below 2,000 feet at the eastern and western boundaries is in many places great within a short distance. The volume of water flowing in the principal streams is large and constant; there is an abundance of water power for generating electricity, and no part of the state is too distant from a source of hydro-electric power, utilized or latent, to be supplied with electricity for lighting and power.



Water Power Development at Great Falls.

The director of the United States Geological Survey, Otis E. Smith, last year made the following statement regarding the amount of horsepower of the rivers named:

Missouri river, minimum 300,000 and maximum 600,000; Milk river, minimum 30,000, maximum 50,000; Marias, minimum 55,600, maximum 75,400; Jefferson, minimum 317,000, maximum 482,000; Madison, minimum 216,000 maximum 276,000; Gallatin, minimum 94,000, maximum 126,000; minor northern tributaries of Missourri, minimum 170,000, maximum 230,000; Musselshell, minimum 23,100, maximum 26,400; Yellowstone, minimum 1,430,000, maximum 2,170,000; minor southern tributaries of the Missouri, minimum 190,000, maximum 360,000; Pend Oreille, Clark Fork, Idaho and Montana, minimum 1,530,000, maximum 2,620,000; Kootenai, Montana and Idaho, minimum 207,000, maximum 357,000; St. Mary, minimum 30,500, maximum 120,000.

Montana's great wealth in hydro electric power has already been developed to a considerable extent. In a distance of seven and a half miles the Missouri river drops 535 feet; the city of Great Falls is located at the head of this series of falls and has a potential water power of 840,000 horse power that may be contrasted with the 35,000 horse power that has made Minneapolis a rich and populous city. Already 75,000 horse power has been developed at the minimum flow, and the completion of a great dam and power plant now in process of construction at the Big Falls, ten miles below the city, will add 100,000 horse power to that now developed.

The Madison River Power Company has its plant near Norris, Madison county, utilizes 15,000 horse power, furnishes power to Butte, to the gold dredges at Alder, to Bozeman and other points in the Gallatin Valley; to the interurban railroad that runs from Three Forks to Bozeman; to Livingston, Big Timber, Hunters Hot Springs, Columbus and Laurel; and to Billings 177 miles distant from the power plant. The high tension lines of this system cover 441 miles.

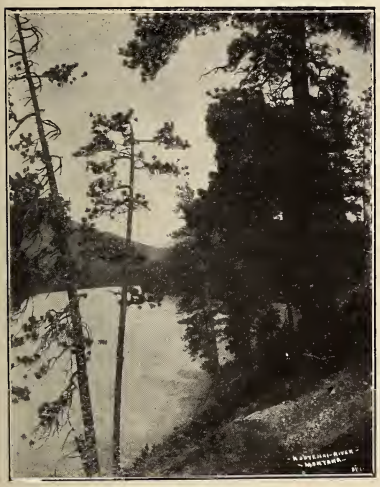
Two small power plants are near Lewistown. The larger one operates under 65 feet of head and has installed 650 horse power of wheels. The Butte Electric and Power Company has at Livingston a power plant that has 1,000 horse power of wheels installed. A second plant owned by the same company at Billings has 2,900 horse power of wheels installed. On the Big Hole river the Montana Power Transmission Company has a plant that furnishes 4,000 horse power to Butte. Near Parrot on the Jefferson river in Madison county the Butte Electric and Power Company has developed 1,000 horse power that is transmitted to Butte.

At Bonner, Missoula county, the Missoula Light and Power Company has developed 4,000 horse power from the Hell Gate river which is transmitted to Missoula, six miles distant, and is used for operating the street railway and for lighting the city. The Flathead river, south of Flathead Lake, has immense power that is to be utilized. The power used in Kalispell is obtained from the Flathead Valley Water Power Company that has a water plant of 1,000 horse power of water wheels. On Landers fork of the Big Blackfoot, in Powell county, a dam has been constructed and a small plant installed. The power obtained is transmitted across the main range of the Rocky Mountains to Gould, a mining camp in Lewis and Clark county. The large power available at Thompson Falls

on Clark's Fork of the Columbia is too valuable to remain much longer unused.

The Kootenai river carries a very large volume of water; and a company organized to utilize the great power now going to waste at Kootenai Falls is expected to construct during 1912 a plant that will supply 80,000 horse power for the towns, lumber mills, mines, and farms of a portion of the state that has great resources undeveloped.

The immense water power of the Missouri river near Helena has been developed by large and costly dams and power houses erected by the United Missouri River Power Company which has to immense dams and generating stations on the Missouri river, 15 miles from Helena, and is constructing a third. The three dams will develop a total head of 220 feet and the waters will be impounded to three storage reservoirs covering 20 square miles and extending over 60 miles along the Missouri river.



Kootenai River.

The Canyon Ferry generating station began operations in the autumn of 1898 with a capacity of 4,000 horse power which was increased to 10,000 horse power in 1902. The power was transmitted to Butte over two transmission lines, the one a duplicate of the other, at a voltage of 60,000. In 1906 the voltage was raised to 70,000, the lines were extended to the Washoe smelter at Anaconda, and a new station was built at Butte having 15,000 horse power capacity. The Hauser Lake plant was in operation from February 12, 1907 to April 14, 1908, when the dam gave way and the water escaped. The power house was saved; the work of reconstruction begun in July 1908, was completed in the spring of 1911. The third dam of this great enterprise is located at Holter, near Wolf Creek station, employs, at times, as many as five hundred men and will be completed in about one year.

A Huge Recreation Ground.

The mountain area of Montana is one huge recreation ground where the tired city man or woman may find rest and strength, and pleasant pursuits for every moment of the day. The visitor can take his choice of many comfortable, though plain dwellings or summer hostelries, or

may pitch his tent wherever he places in a mountain canyon where wood and water are convenient. He may spend the day fishing for the trout and grayling that abound in all streams, or he may climb hills and mountains; he may enjoy a ride on one of the surefooted mountain horses; he may gather a posy of the wild flowers that carpet the hillsides and interest the botanist and delight the lover of beautiful things; if interested in geology he may find spread before him a book every page of which is of absorbing interest; or he may just loaf around and enjoy himself, feast his eyes on the beauties of nature spread out before him, drink in the health giving air and unconciously build up strength of muscle and of nerve. When night falls he will seek his couch early, under the canopy of stars if it is spread in the open, and lulled to slumber by the music of a murmuring mountain stream to him will come the blessing of a long, undisturbed and restful sleep. And the appetite, how it will grow! The amount of food he will consume, with enjoyment of every particle, will astonish him. In the mountains the artificialities of city life are cast aside; a man is small compared with his surroundings and is valued at what seems to be his worth as a person and not for what he may own.

Montana has many thermal and mineral springs that are pleasant places of resort and whose waters are beneficial in the treatment of many diseases. Accomodations to satisfy the most exacting may be found at some of these; at others, situated at a distance from a railroad, hotels have not yet been built. Favorite springs of the state, where hotel accomodations may be found, are Hunters at Springdale, Chico at Emigrant, Corwin Springs at Corwin Springs station, all in Park county; White Sulphur Springs at the town of that name in Meagher county; Alhambra and Sunnyside at Alhambra, Boulder at Boulder, and Pipestone at Pipestone, all in Jefferson county; Gregson, in Silver Bow county near Butte; and Quinns near Paradise, Sanders county. Other mineral springs are at Norris, Potosi, near Pony, and Pullers Springs in the Ruby valley, Madison county; near Bozeman, Gallatin county; far up the Sun River in Teton county and at Lolo in Missoula county. The Medicine Hot Springs, near Darby and Sleeping Child Springs are in Ravalli county. At some of these places good accommodations may be had.

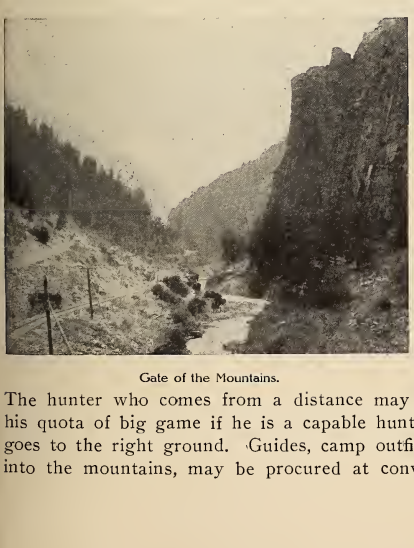
Fishing in Yellowstone River Near Corwin Springs.

At Camas, Sanders county, in the recently ceded Flathead Indian reservation, are remarkable springs that are said to equal in the virtues of their waters the most famous mineral springs of this coun-

try or of Europe. They are to be improved and made attractive as a place of resort. White Sulphur Springs has been purchased by Mr. John Ringling, the proprietor of the great circus; a railroad has been constructed to connect them with the Chicago, Milwaukee and Puget Sound Railway and plans made to establish there one of the most attractive resorts in the country. The flow of water is copious, it possesses many healing virtues, and the surrounding country is one of much scenic beauty. The Broadwater Natatorium, just outside of Helena and reached by street cars, to which are conducted the waters of Helena Hot Springs, has the largest swimming pool in the world, is a place of resort for citizens of Helena, and has been visited by distinguished men and women from all parts of the country. In the spacious and beautiful grounds is an extensive hotel building that is not now open. Those who wish to take advantage of this resort should come to Helena where ample accommodations are to be had.

These thermal and mineral springs are valuable natural resources. Analyses of their waters and medical counsel as to their efficacy in the treatment of diseases may be obtained by writing to the proprietors at the places indicated. The Secretary of the State Board of Health, Helena, Mont., has knowledge of the merits of the waters of many of the mineral springs and physicians may write him for advice where to send their patients.

Montana has unequalled attractions for the hunter and the fisherman. The mountain streams, lakes, and rivers are filled with trout and greyling. The ample natural supply is added to by fry, hatched at the State Fish Hatchery at Anaconda and the United States Fish Hatchery at Bozeman and placed in the streams. Montana is the favorite ground for the hunter of elk, deer, bear, mountain sheep, and mountain goats. It is unlawful to kill antelope, moose, or buffalo. Coyotes, wolves, lynx, and mountain lions are predatory animals whose destruction is encouraged. Small game include rabbits, ducks, brant, geese, sage hens, pheasants, prairie chicken, and grouse fo several varieties. Game is protected; and a license is required both for residents and non-residents to hunt during the open season. The hunter who comes from a distance may reasonably expect to secure his quota of big game if he is a capable hunter or is willing to learn and goes to the right ground. Guides, camp outfits, and pack horses for trips into the mountains, may be procured at convenient points or the hunter

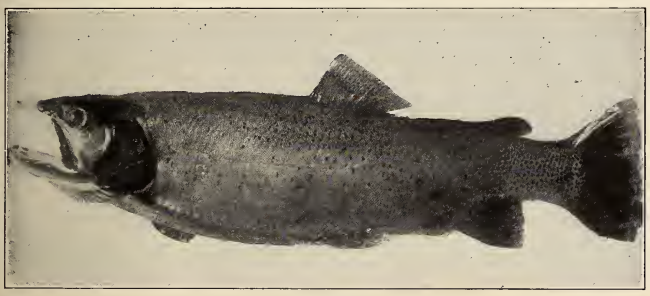


Gate of the Mountains.

may find a house to stay in and to hunt from. The State Game Warden, Henry Avare, Helena, Montana, will, on application, furnish a copy of the game laws, a booklet telling where fish and game may be found, a list of guides, and other information relating to the hunting and fishing advantages of Montana.

The scenery of Montana is of varied beauty, picturesqueness and grandeur and is an asset of unique value to the state. Along the lower course of the Missouri river are curiously carved rock formations that excited the admiration of early writers and of which drawings were made for the engravings that illustrate the volume of travel of Maximillian, Prince of Weide. Near Helena is "The Gate of the Mountains," which rivals in scenic beauty the Grand Canyon of the Yellowstone. Professor Canby of the Transcontinental Survey wrote: "These gentlemen of our party who have visited the Yosemite Valley considered the scenery of Marias Pass to be of more varied character and grander in yever respect." The mountains south of the Yellowstone rivers, in Carbon, Sweet Grass and Park counties contain high peaks, beautiful lakes, cascades and mountain streams. A curiosity is the Grasshopper glacier. On the Boulder river is a wonderful natural bridge. Near Bozeman is the beautiful Bridger Canyon and river and mountain scenery scarcely equalled anywhere. The Yellowstone from its source to its mouth is a beautiful

river set in a picturesque frame. The Northern Pacific Railway in its route through Rocky Canyon west of Bozeman tunnel, through Jefferson Canyon, and in climbing the divide east of Butte, passes through some of the grandest scenery in America. On the Madison, the Jefferson, the Hellgate, the Bitter Root, Clark's Fork of the Columbia, the Flathead and the Kootenai, are many scenes of beauty. In passing through Sixteen Mile Canyon, east of Lombard, passengers on trains on the Milwaukee railroad view scenery they will never forget. The line of the Great Northern Railroad, both on the Montana central division and on themain line, east and west of the Continental Divide, passes through a region of beautiful streams and lakes and within sight of rugged mountain ranges. A picturesque section of the state is also traversed by the Oregon Short Line. One of the scenic wonders of America is the series



A Montana Trout.

of cascades that constitute the Great Falls of the Missouri river. This is one of the largest and most picturesque waterfalls in America. Many smaller falls of great beauty are in Carbon, Sweet Grass, Park, Gallatin, Ravalli, Sanders, Flathead and Lincoln counties.

There are many beautiful lakes. Flathead, the largest is one of the most picturesque bodies of water in the world. It has an area of about 200 square miles and is surpassed in size by but one fresh water lake west of the Mississippi river. Many bays and inlets indent the shore lines and there are several small islands. According to Henry Gannett, president of the National Geographical Society, the greatest length of Flathead Lake from north to south is twenty-six miles and the greatest bredth from east to west is fourteen miles. Other lakes of great beauty are East Rosebud Lake, Carbon county; Cliff Lake, Madison county; Mystic Lake, Gallatin county; Crystal Lake, Fergus county; Georgetown Lake, Deer Lodge county; Lake Como, Ravalli county; McDonald Lake, Missoula county; Whitefish Lake, Flathead county, and Thompson Lake, Lincoln county. Many other lakes, large and small, nestle in the mountains of Flathead and Lincoln counties. The northwestern corner is the lake region of Montana. In Glacier Park, on both sides of the Continental Divide, are lakes of remarkable beauty.

The mountain peaks are not as high as in Colorado and no bold summits like Mt. Hood or Mt. Rainier are to be seen. The mountain climber however, in Glacier Park, in the Madison, the Gallatin, and the Absarokee ranges may find summits never, or rarely, attained by man.

One of the most wonderful caves that has been discovered is the Lewis and Clark cavern near Lime Spur station on the Butte branch of the Northern Pacific Railroad. Wandering hunters discovered a small opening in the ground some years ago and found it to be the entrance of a large cave. Further explorations showed the cave to be most extensive. It was at first called Morrison's cave after the proprietor of the limestone quarry nearby. Much work has been done in exploring the interior, in making steps to descend, and in laying out paths leading to the various chambers. Not many persons have yet visited the Lewis and Clark cavern—this cave that rivals in extent and beauty the Mammoth Cave in Kentucky and the Luray Caverns of Virginia,—but when knowledge about it has spread, when accomodations for visitors shall have been provided, and arrangements made for railroad trains to stop near the entrance, the wonders of this cave should be seen by thousands every year. Names have been given to various chambers and to many of the fantastic and beautiful formations of stalagmites and stalactites that make this cavern one of the most beautiful and interesting in the world.

The main entrance to the Yellowstone National Park is at Gardiner, Park county, and the only other entrance reached by the railroad is at Yellowstone, Gallatin county. During the past year 30,000 visitors saw this unique wonderland. Near the Park, but outside of it and free from military control, is mountain scenery that surpasses anything the tourist sees in making the usual trip; a few hours ride brings him to the Rocky Mountains; on either side are tempting places for rest and recreation; and the Glacier Park is not distant. Visitors to the Yellowstone Park, after seeing that wonderful region, should not be content to return to their homes until they have seen some of the scenic attractions of Montana that lie beyond the range of their vision from a car window.

Glacier National Park.

Pyramid Peak.

The Glacier National Park, established in 1910, embraces a portion of Montana that surpasses Switzerland in beauty and grandeur of scenery. John Muir described it as one of the most favored spots in the continent, a place where men might find almost the springs of renewed life. At least, he said a season's sojourn in this region should add ten years to the term of the traveler's earthly sojourn. The scenery throughout the park is remarkable for its beauty

Sunset on St. Mary's Lake.

and grandeur, and Lake McDonald, Kintla Lake, St. Marys, and Two Medicine Lake will, in the course of a few years, become known as among the most beautiful lakes in the world. The park takes its name from the glaciers that are its distinctive feature.

Seven miles from the head of Lake McDonald is Glacier Camp an hours climb from which leads to Sperry's Glacier which was named for Prof. L. B. Sperry of Oberlin College, the noted explorer and lecturer. The serrated edge of this interesting ice formation measures in width over two miles, and from its upper edge to the end of the longest finger is a stretch of five miles of blue ice. At one time this ice sheet extended a mile farther down and plunged over the abrupt precipice that walled the Avalanche Basin. Its deserted track furnishes today an open page whereon the process of glacial erosion and deposit may be studied even more plainly and instructively than in the days of its greatest extent. Nearly every glacial phenomenon described in the books, it is said, may be found illustrated in this unique body of ice.

The following is a part of a description given by Robert H. Chapman of the territory embraced in Glacier National Park:

The area of the Northern Rocky Mountains which lies to the north of the Great Northern Railway and to the south of the Canadian boundary is one of the most beautiful mountain regions in the world. To the easts of the mountains the plains region, drained by the Missouri and Saskatchewan river systems, stretches mile upon mile of open grass land, practically treeless.

In sharp contrast to the plains rise the mountains, which, seen from the distance, present a rock wall of great steepness, extending apparently unbroken for miles. This, the eastern face of the range, is actually cut by long U-shaped canyons, which have been largely formed by the great glaciers which once flowed from the mighty snow-covered peaks and ridges forming the divide between the waters of the Atlantic and Pacific oceans.

In the canyons are roaring streams, which head in the melting ice and snow, flow into placid lakes and eventually into the arroyos of the plains. Between the canyons the long, finger-like ridges rise to considerable heights, the timber-covered foot sloping steeply until a region of brush-covered broken rock is reached, which, in turn leads to the base of precipitous cliffs.

The canyons at the head usually terminate in great amphitheaters, rising cliff over cliff in a stairway of tremendous proportions, many steps of which retain an ice mass slowly flowing across it, each fed from a large ice field above, until a region of huge snow banks is reached. The main Rocky Mountain mass is actually made up of two principal ranges, generally parallel, with axis in a northwesterly and southwesterly direction, the eastermost of which is the Lewis range, which extends but a short distance across the Canadian boundary. The western, or Livingston, range, persists much farther northward. At a point about eleven miles south of Canada it becomes the watershed of the Continental Divide, which has previously followed the ridge of the Livingston range.

The ranges are the remnants of what was once a much wider plateau-like region of rock which has been carved and shattered by the forces of erosion, principally those of the glaciers. Upon this great mass are the higher peaks, huge pyramids and blocks, with cliffs and precipices hundreds and sometimes thousands of feet plunging away to the roaring treams of the valleys, or ending in the great crevasse at the head of some glacier. To the westward the mountains break precipitously, and from the foot of the steep, long, timber-covered ridges reach out toward the valley o fthe Flathead river. Between these ridges and extending up the canyons of th

higher range are many miles of lakes, joined by rushing streams similar to those on the eastern side.

The whole region is inhabited by wild animals. The streams and lakes abound in fish of many varieties. In the higher barren rock areas the white goat is found in great numbers, while on the slightly lower ridges, where some protection is afforded by stunted timber growth, brush, and slide rocks, the bighorn Rocky Mountain sheep has his haunts. In the valleys and on the lower spurs are many deer and moose; in places a few elk are found, and over the whole area, from high glacier and snow field to huckleberry bush of valley and flat, the grizzly roams. All the game animals use the higher mountain districts for summer range only as the area is too high and the snowfall too heavy to permit of winter use. * * * *

Avalanche Basin.

There are numerous passes through the higher ranges. Across these the game trails lead from valley to valley: following the game came the Indians; the hunter and the trapper, looking for easy routes of travel, followed the Indians; then the government engineers exploring and mapping; and finally the hardier of the tourists and lovers of nature. Most of these passes are closed for many months of each year by snow; some of them are available only after the use of the ax to give footing on the hard ice of glaciers lying close to the divide, but one or two of them are of such a nature as to eventually accommodate wagon roads, by which persons unfitted for the strenuous efforts now required to reach the higher country may have opportunity to view it at close range. None of them that are south of the Canadian boundary will ever be used for a railway route. At some future day the locomotive may cross from Canada to the waters of the Flathead river and southward to the towns and farming valleys adjacent to Columbia Falls and Kalispell, and form a link with the Great Northern Railway. A route on the west side of the Flathead river is very available for the location of a railroad track. In the valley of the Flathead river are several miles of land which are admirable for grazing purposes, but over the greater part of the area the soil is so thin as to preclude its extensive use for farming.

Within these limits there are 250 lakes, ranging from ten miles to a few hundred feet in extent; there are more than sixty glaciers between five square miles and a few acres in area; there are animals, plants and rocks in number and quantity to satisfy the most ardent student, and views of great variety, beauty and grandeur to gratify the artist and lover of nature.

Every stream and pass and mountain in Montana has a part in the history of the romantic deeds of the brave and adventurous men who explored the territory, built the railroads, and developed the mines, the ranches, and the farms. The exploits of the pioneers of America—the men who exhibited so much courage in times of peril, performed such great deeds in pushing westward the frontiers of civilization and made glorious histories in founding mighty commonwealths—should invest American historic and scenic places with an interest to American citizens not to be

A Scene in Teton County.

equalled by places on foreign soil and should induce them to "See America First." If they have already seen Europe there is a still stronger reason why they should see their own country. In friendly emulation with other states Montana enters the lists, and challenges comparison as the place to be preferred for a summers' outing, calls attention to the salubrity of the climate, the clearness of the water, the purity of the atmosphere, the variety of the pleasures that may be enjoyed and to the unequalled beauty and grandeur of the scenery of "The Treasure State."

THE PIONEER PERIOD.

There is no space to recount here, even in bare outline, the extremely interesting history of Montana. The eastern part was in the Louisiana Territory which was ceded to the United States in 1803, and the western part was in the Oregon Territory which was discovered by Captain Robert Gray in 1792. Lewis and Clark passed through it from east to west in 1905, on their journey of exploration to the Pacific, and from west to east on their return in 1806. After them came trappers, fur traders, explorers, and missionaries; but there were only a very few whites in its vast area until large numbers were attracted by the discoveries of placer gold at Gold Creek, Bannack, and Virginia City, 1862-3. This influx of population caused the creation of Montana Territory in 1864. The first industry was mining of placer gold. Some of the gulch diggings were marvelously rich, Alder, Last Chance and Confederate gulches being the most productive. Those were flush times in Montana. As the placers became exhausted many restless spirits moved away. Farming and stock raising were begun soon after the gold discoveries. Quartz mining was a somewhat later development. Gold and silver mines were very productive. Then followed the beginning of copper mining at Butte which was destined in a few years to attain such vast proportions, Meanwhile settlements of stockmen and farmers were extended, though hostile Indians roamed the plains and were not subdued until after the Custer massacre.

Captain Lewis' First View of the Rocky Mountains.

The pioneer period may be held to include all the years previous to 1883, when the Northern Pacific Railroad was completed across Montana.

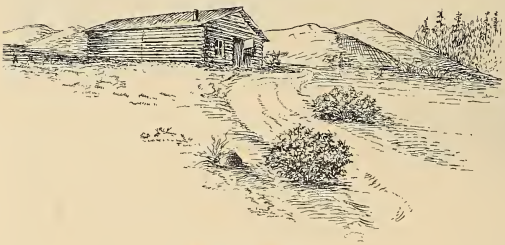
There is not one dull page in the history of pioneer days. As one writer, himself a pioneer, said: "These were days of adventure, heroism and romance in Montana but a tithe of which has been written and even the traditions of which are vanishing day by day as one after another of the old timers is laid to rest beneath the shadows of his beloved mountains."

Montana was admitted into the Union as a state November 8, 1889.

RAILROAD DEVELOPMENT.

There were no railroads in Montana before 1880 when the Utah Northern, now the Oregon Short Line, was completed to Butte. Prior to that time freight and passengers came overland by team or stage, starting from towns on the Missouri river in Missouri or Kansas; or by boat up the Missouri river to Fort Benton, the head of navigation; or, after the construction of the Union Pacific Railway, from Corrine, Utah; by either route a long, tedious, and costly journey.

The Northern Pacific Railway was completed across the continent September 8, 1883, the event being celebrated by the driving of a gold spike at a point between Garrison and Gold Creek. A gala day at Helena was July 4, 1883, when the people assembled in thousands to welcome the arrival of the first regular train and to witness the departure of the first bullion train. The latter consisted of thirty-six new box cars and bore the inscription "1,000,000 Pounds Gregory Bullion From Helena, Montana."



Early Day Stage Station.

The next great step was the building of the Great Northern Railroad across the northern part of Montana, and the connection of the two systems by the Montana Central Railroad that extended from Butte to Havre. The Burlington system extended its lines as far as Billings, and local capital built the Montana Railroad from Lombard to Lewistown. Numerous branch lines were built by the Northern Pacific and by the Great Northern railroads. The Shelby branch of the latter system extends north from Great Falls to the Canadian line, and the Billings and Northern branch penetrates the central part of the state extending from Great Falls, a center for many branch lines, to Billings. Connection is made at Laurel or Billings with the Burlington system whose through trains run over this line to Great Falls, proceed to Shelby, and thence go west on the main line of the Great Northern to the Pacific coast. This branch crosses the Chicago, Milwaukee and Puget Sound Railway near Judith Gap, connects with the Northern Pacific Railroad at Laurel and has opened to profitable farming great areas in the "Inland Empire" section.

The Butte, Anaconda and Pacific Railroad carries the ores of Butte

to the smelter at Anaconda and though short of length is a very successful enterprise. Work has begun on an extension west to Georgetown Lake.

The great event in recent railroad construction was the building across the whole length of Montana of the Chicago, Milwaukee and Puget Sound Railway. This is the western extension of the Chicago, Milwaukee and St. Paul system. It was built between the lines of the two older systems and gave transportation facilities to a part of the state that was without them. This road has been completed two years, is a financial success, and has been the cause of the rapid development of the section it traverses.

There are rumors that other transcontinental lines will be extended into this productive territory. In 1879 the railroads mileage of Montana was "0"; at the close of 1911 it is 4,299 miles. In 1894 the mileage was 2,735 and in 1907, 3,307. Montana is about to enter upon a period of great railroad development. Small undertakings recently completed are the

A Fast Passenger Train.

branch lines of the Great Northern from Bainville to Plentywood in Valley county, the Shields river branch of the Northern Pacific, the Montana Western from Conrad to Valier, the closing by the Burlington of the gap between Bridger and Scribner, the Milwaukee's branch through the Gallatin valley, the Yellowstone Park and White Sulphur Springs Railroad from Ringling on the Milwaukee to White Sulphur Springs, and the Pittsburg and Gilmore to Armstead. Track is being laid on the Northern Pacific branches from Glendive to Sidney and from Manhattan to Camp Creek. The Pittsburg and Gilmore, will extend its lines through Dillon to Whitehall and probably connect near Boulder with the Great Northern line. Work will probably begin in 1912 on the important Mondak-Helena line of the Great Northern that will traverse the counties of Dawson, Fergus, Meagher, Broadwater, and Lewis and Clark, and open to development a great area of fertile farm lands. The

Glendive-Helena cut-off of the Northern Pacific is part of this plan as the two roads are to use the same track for a considerable part of the way.

A contract has been let for the construction of a line to connect Lewistown with the Billings and Northern division at Moccasin and is the first part of this plan to be carried out. It is thought that ultimately the Great Northern will build from Great Falls up Sun River, across the main divide, and connect with its main line in Flathead county. The Great Northern has already completed the grade of a line from Vaughn to Augusta in the Sun River country and the road should be in operation by the first of 1912. There is a likelihood that the Great Northern will build through the Flathead Reservation from Kalispell or vicinity a branch road from the main line to connect with the Northern Pacific at or near Dixon. This north and south line will afford needed railway facilities to settlers in the newly opened Flathead Reservation and bring Flathead and Lincoln counties into closer relations with the principal cities of Montana.

Railroads are Succeeding Stages.

The Milwaukee has just finished the construction of a branch from Lewistown to Hilger, a new town near the important mining camp of Kendall. The line may be tended from there north to Great Falls. From Lewistown the plan, it is said, is to build to the main line on the Musselshell river. From Great Falls it is thought that the Milwaukee will build up Sun river, cross the main divide, and connect at some point on the Big Blackfoot river with the line of the Big Blackfoot Railroad Company which is believed to be a subordinate company of the system and whose tracks connect with the main line near Bonner. Map and profiles of a branch the Milwaukee railroad contemplates building from the Blackfoot Valley into the Flathead Valley and thence north into Canada were filed in the United States Land Office at Kalispell last year. The route begins at Clearwater, Powell county, follows Swan River to Swan Lake and thence, eastward of the town of Big Fork, along the east side of the Flathead river to a point near Creston where it turns and runs in a western direction, crosses the Flathead river east of Kalispell and approaches the city on the wide flat that adjoins it on the east. From Kalispell the route is northward to the north fork of Flathead river which it follows to the international boundary line. It is also expected that the Milwaukee will soon build branch lines from Roundup to Billings, from Three Forks to Radersburg and thence to the Missouri river with Helena as its ultimate destination; from Harlowton to Columbus, and from some point on the main line through Melville

to Big Timber. The statement has also been published that foreign capital has become interested in a company that has a plan to build a railroad from Butte through Boise to San Francisco.

Railroad officials have not given out definite information regarding these proposed extensions nor have they stated when work will be begun, but there is more than a probability that the year 1912 will witness the starting of construction work on at least the more important of these branch lines. If all are constructed the effect will be to cause the settlement upon, and cultivation of, many million acres of farm lands which are now untilled because of lack of transportation facilities. Also they will make available timber tracts which are now too remote from railroads to be utilized. In the eastern part of Montana are great coal fields which cannot be developed until transportation by rail is provided; old mining districts in the mountain regions may spring into renewed life with the coming of the railroad; and new deposits of precious metals may be discovered to reward the toil of the prospector.

These new lines of railroad—and more—will be needed to handle the freight and passenger traffic which will originate in Montana when her resources shall have been developed.

The Gallatin Valley Electric Railway is in operation from Bozeman to Salesville, a distance of eighteen miles. It was the first inter-urban electric railway to be built in Montana and its success will encourage the building of others. A company has been organized to construct an electric line from Helena to Butte; and one from Billings through the Yellowstone Valley to Laurel and south into the valley of Clarks Fork of the Yellowstone, and another from Columbus to Cooke City have been proposed. Probably an electric railway will be built through the Bitter Root Valley within a year or two, and that a line will be constructed from Missoula to Flathead Lake. The citizens of the enterprising towns of Flathead county realize the advantages that will follow the construction of an electric line and have begun work on the first section of the Flathead interurban railroad.

Hauling Wool.

The construction of railroads has always been followed by an expansion in all lines of business, and the development of the state has been greatly aided by the effective publicity work that has been done by each of the trans-continental lines that crosses it.

DEVELOPMENT OF EDUCATION.

Between the date of the first settlements and the present time the different church organizations have extended their activities without intermission, and all the principal denominations and many of the minor ones have well sustained churches. Montana is a diocese of the Protestant

Garfield School at Billings.

Episcopal church, and is separated into the two Roman Catholic dioceses of Helena and Great Falls. The Methodist Episcopal, the Methodist Church South, the Baptist, the Presbyterian, the Christian, and the Congregationalist, denominations have many members. Church societies are numerous. There are denominational elementary schools and colleges in the principal cities.

The pioneers of Montana realized the necessity of providing for the education of the children and instituted the public school system in 1864. There were 1,359 school children in Montana in 1868 when the first school census was taken; in 1910 the number of children under the age of twenty-one was 126,944. The increase since 1905 was 26 per cent. The constitution of the State of Montana provides: "It shall be the duty of the Legislative Assembly of Montana to establish and maintain a general, uniform, and thorough system of free, common schools." This duty has been performed; and a complete public school system extending from the primary grade to the university established. A State Board of Education consisting of the Governor, Attorney General, and State Superintendent of Public Instruction, ex-officio, and eight appointed members supervise

Students of the School of Mines at Work.

the state's educational institutions. In every county a county superintendent supervises the local schools.

In 1910 there were 1,188 graded public schools, 15 county high schools and 14 city high schools. There is a law providing for compulsory education and new school districts are established as new sections are settled. Those who desire to get detailed information relative to the public schools should write to the Superintendent of Public Instruction, Helena, and ask for a copy of his last report.

The ratio of illiteracy is very low, and the people of Montana are proud of the excellence of the system of public instruction that has been established. The public schools are liberally supported by taxation and have a rich endowment in the two sections of land in each township that were granted for their support when the state was admitted into the Union.

The school lands were originally about 5,000,000 acres. A small portion of the land has been sold but not an acre for less than ten dollars, and the proceeds of all sales are invested and the interest used for the support of the public schools. The greater part of the school lands is leased and a large income is derived from the rentals.

The following tables contain the latest statistics relating to public schools:

PUBLIC SCHOOL STATISTICS FOR THE YEAR ENDING AUGUST 31, 1910.

COUNTIES.	Buildings. Number School	Value of School Buildings and Sites.	Value of School Libraries.	Amount Expended for School Purposes.	Census of School Children.		
					Children between 6 and 21.	Children under 6.	Total.
Beaverhead	31	$ 58,700.00	$ 1,638.00	$ 31,603.71	1,508	590	2,098
Broadwater	21	20,280.00	1,013.00	13,663.71	1,508	300	1,139
Carbon	53	167,225.00	2,953.71	52,218.42	4,054	1,740	5,794
Cascade	83	440,999.50	5,918.50	193,555.56	7,888	3,349	11,237
Chouteau	62	143,500.00	5,326.00	88,474.70	4,436	1,701	6,137
Custer	66	149,915.00	5,624.00	97,075.42	3,482	990	4,472
Dawson	59	88,160.00	4,095.00	52,254.90	3,009	1,695	4,704
Deer Lodge	23	208,155.00	3,669.00	60,160.70	3,131	1,566	4,697
Fergus	83	151,180.00	5,036.32	97,847.67	4,367	2,033	6,400
Flathead	50	191,145.00	4,020.00	112,132.79	4,884	1,899	6,783
Gallatin	59	223,323.00	3,215.00	79,931.56	3,905	1,546	5,451
Granite	15	38,115.00	1,719.00	13,489.80	805	271	1,076
Jefferson	24	68,500.00	1,028.32	40,644.65	1,272	480	1,752
Lewis and Clark	54	521,850.00	5,343.20	145,552.20	5,017	1,664	6,681
Lincoln	18	51,720.00	1,397.00	31,021.80	823	275	1,098
Madison	59	97,045.00	7,041.00	43,536.30	1,946	908	2,854
Meagher	27	57,910.00	1,265.85	40,235.24	842	298	1,140
Missoula	50	204,426.00	4,837.53	140,491.68	4,716	1,910	6,626
Park	53	140,261.00	2,570.00	53,745.63	2,704	1,326	4,030
Powell	28	81,009.00	490.00	25,325.00	1,410	511	1,921
Ravalli	35	127,675.00	3,787.00	76,441.56	3,093	1,161	4,254
Rosebud	33	67,107.40	3,440.00	43,126.80	1,153	564	1,717
Sanders	20	94,175.00	1,257.25	47,122.31	958	366	1,324
Silver Bow	35	973,830.00	5,047 11	355,204.12	11,570	5,763	17,333
Sweet Grass	36	65,745.00	1,992.15	23,791.09	1,054	431	1,485
Teton	27	50,905.00	2,145.00	46,640.75	1,927	1,039	2,966
Valley	44	131,002.17	3,124.00	62,174.11	3,203	1,787	4,990
Yellowstone	40	380,125.00	2,032.00	162,771.79	4,737	2,048	6,785
Total	1,188	$4,993,983.07	$91,019.44	$2,230,585.32	88,733	38,211	126,944

The state institutions of higher education are the University of Montana located at Missoula; the Montana College of Agriculture and Mechanics Arts at Bozeman; the School of Mines at Butte; and the State Normal College at Dillon. Each institution is among the best of the kind in the United States; the faculties are competent and the equipment good; the instruction is thorough, and there is no need for a Montana student to leave the state to secure a liberal or technical education. The state maintains also at Boulder a school for the Deaf and Blind; at Twin Bridges is the State Orphans' Home, and at Columbia Falls is the Soldiers' Home. The insane are cared for at an asylum at Warm Springs. The State Reform School is at Miles City and the State Prison at Deer Lodge.

DEVELOPMENT OF MINERAL WEALTH.

Production of Gold, Silver, Copper, Lead, and Zinc—Coal area and Coal Mining.

The small population that has inhabited Montana has gone steadily on in the work of building up a great state. They have established efficient state, county, and city governments, converted the wilderness into a pleasant place of abode, built churches and schools, roads and bridges, and have cleared the way for those that may now come to share in the benefits of a community having all the advantages of an advanced civilization. The results of experiments made by the pioneer in mining, in stock growing, in farming, and in horticulture, have passed into the fund of common knowledge. The man that turns raw land into a farm is in a sense a pioneer but has to undergo not a tithe of the hardships of the pioneer days.

Montana has enriched the world by $1,494,624,800 worth of gold, silver, copper, lead, and zinc. Montana horses, cattle, sheep and wool, have added great sums to the wealth of the nation. The value of the products of the small part of the soil that has been reduced to cultivation is yearly increasing, and farms have already produced crops worth hundreds of millions of dollars.

One great resource, mineral wealth, has been developed to a great extent as the following table shows:

PRODUCTION OF GOLD, SILVER, COPPERAND LEAD IN MONTANA, FROM THE YEAR 1862 TO 1910, INCLUSIVE.

Year.	Gold.	*Silver.	Copper.	Lead.	Totals.
1862 to 1881	$200,000,000	$11,000,000	$.....	$.....	$211,000,000
1882	2,550,000	4,370,000	1,539,860	.....	8,459,860
1883	1,800,000	6,000,000	3,452,960	226,424	11,479,384
1884	2,170,000	7,000,000	5,386,500	246,326	14,802,826
1885	3,400,000	11,500,000	6,779,800	274,350	21,954,150
1886	4,422,000	13,849,000	5,761,200	494,132	24,526,332
1887	5,978,536	17,817,548	8,853,750	607,662	33,257,496
1888	4,200,253	15,790,736	15,103,946	569,160	35,664,095
1889	3,500,000	19,393,939	13,334,970	456,975	36,685,884
1890	3,300,000	20,363,636	16,656,437	675,392	40,995,465
1891	2,890,000	20,139,394	14,377,336	1,229,027	28,635,757
1892	2,891,386	22,432,323	19,105,464	990,035	45,419,208
1893	3,576,000	21,858,780	16,636,958	964,089	43,029,827
1894	3,651,410	16,575,458	17,232,718	730,551	38,191,137
1895	4,327,040	22,886,992	21,114,869	754,360	49,083,261
1896	4,380,671	20,324,877	25,356,541	670,010	50,732,099
1897	4,496,431	21,730,710	26,798,915	928,619	53,954,675
1898	5,247,913	19,159,482	26,102,616	809,056	51,319,067
1899	4,819,157	21,786,835	40,941,906	909,410	68,457,308
1900	4,736,225	18,482,211	39,837,135	701,156	63,746,727
1901	4,802,717	18,334,443	36,751,837	498,622	60,387,619
1902	4,400,095	17,662,285	24,606,038	332,749	46,961,137
1903	4,590,516	17,097,702	28,200,695	387,445	50,276,355
1904	5,097,786	18,887,227	36,410,310	195,525	60,590,848
1905	4,889,234	17,359,912	48,165,277	227,160	70,677,583
1906	4,479,014	8,027,072	56,165,288	254,290	68,855,764
1907	3,286,212	6,149,619	44,021,758	198,660	53,656,249
1908	3,057,640	5,488,785	33,220,149	193,056	42,036,710
1909	3,791,510	6,436,931	40,567,541	128,287	51,429,694
1910	3,730,486	6,892,216	35,846,412	176,570	48,358,253
Total	$314,452,232	$454,794,113	$708,254,183	$14,829,198	†$1,494,624,800

* Silver coinage value to 1906. † Grand total includes value of zinc in 1908, 1909 and 1910.

Production
of
Copper
$708,254,189 00

Grand Prize for Mining Industry.

Production
of
Gold and
Silver
$769,246,345.00

The production of zinc rose from a value of $77,080 in 1908 to $505,425 in 1909 and to $1,712,569 in 1910, and Montana gained third place in the list of zinc producing states.

The production of copper has fallen off on account of the low price of the metal, and the amount of gold and silver produced has decreased because fewer tons of copper ore, of which gold and silver are important by-products, have been mined.

The production by counties, 1910 was as follows:

(By Victor C. Heikes, U. S. Geological Survey.)

COUNTY—	Ore Treated —Tons.	Gold (a)	Silver— (Fine ounces)	Copper— Pounds.	Lead— Pounds.	Zinc— Pounds.	Total Value.
Beavernead	992	$ 57,105	51,649	59,313	273,985	.....	$ 104,583
Broadwater	14,883	321,955	21,480	124,938	245,935	.....	360,243
Cascade	1,381	2,170	57,060	18,415	298,489	.....	48,455
Chouteau, Flathead and Lincoln	56,656	507,839	45,898	18,301	26,605	.....	536,117
Deer Lodge	5,604	136,417	29,602	4,822	.....	.....	153,014
Fergus	145,747	636,752	9,283	1,167	60,254	18,000	645,536
Granite	6,745	80,443	308,423	18,867	26,321	.....	250,545
Jefferson	57,271	133,709	1,029,579	122,109	1,975,492	.....	792,111
Lewis and Clark	45,510	190,903	58,923	4,306	196,883	.....	231,969
Madison	31,721	810,921	115,745	39,159	243,543	.....	889,112
Meagher, Park and Ravalli	260	4,442	4,437	15,789	195,819	.....	17,492
Missoula, Sanders	2,184	39,956	13,722	36,733	164,752	.....	59,281
Powell	1,063	42,719	16,146	79,767	48,041	.....	63,681
Silver Bow	4,709,429	765,155	10,400,840	284,264,862	350,173	31,620,184	44,206,144
Total	5,079,446	$3,730,486	12,162,857	284,818,553	4,106,292	31,638,184	$48,358,253

(a) Includes placer production.

Coal Area and Coal Mining.

They have begun the mining of coal, which is one of the greatest resources of Montana. Prof. Rowe of the University of Montana at Missoula, in Bulletin No. 37 entitled, "Montana Coal and Lignite Deposits," discusses the coal fields in detail and gives analyses of the various coals. Concerning the extent of the coal fields he says:

"According to estimates given by Storrs in the Twenty-second Annual Report of the U. S. Geological Survey, Montana has an area of about 13,000 square miles of anthracite, bituminous and lignitic-bituminous coals. The lignite areas including the Cretaceous and Tertiary will undoubtedly aggregate more nearly 50,000 square miles than the area heretofore given of 25,000 square miles. The bituminous area of Montana exceeds the combined bituminous areas of North Dakota, South Dakota, Wyoming, Utah and New Mexico; and is only exceeded in the Rocky Mountain states by Colorado. Her lignite area is next to that of North Dakota, and exceeds the combined lignitic areas of all the other states of the Rocky Mountains.

"All but three counties, Silver Bow, Sanders and Jefferson, have coal or lignite deposits, as soon as developed, or commercial value. Few states can boast of such a distribution of natural fuel. In the eastern part of the state the ranchers and townspeople, as well, burn nothing but lignite. Any one living on the plains and desiring a load of fuel, simply drives to his favorite nearby seam and procures it. This is, indeed a blessing. No timber to speak of within miles, and oftentimes remote from a railroad, the people are permitted to live and develop this great country without worry and but little trouble in securing the much needed article in the development of every country—fuel."

The following table contains a comparison of the coal deposits of Montana with those of other states:

MONTANA'S WEALTH IN COAL.

State.	Area, Sq. Miles.....	Estimated Original Contents, Short Tons.....	Total Exhaustion, Short Tons.....	Estimated Available Supply Short Tons.....
Pennsylvania	14,200	112,574,000,000	3,152,000,000	109,422,000,00
Ohio	12,660	86,028,000,000	820,000,000	85,208,000,00
Maryland	455	8,044,000,000	234,000,000	7,810,000,00
Kentucky	16,670	104,028,000,000	215,000,000	103,813,000,00
Indiana	6,500	44,169,000,000	280,000,000	43,889,000,00
Illinois	35,600	240,000,000,000	1,117,000,000	238,883,000,00
Montana	34,067	303,060,000,000	44,000,000	303,016,000,00

A Montana Coal Mine and Washer.

The output of the coal mines of Montana in 1909 was 2,541,679 tons and in 1910, 2,970,246 tons. The annual consumption of coal in the state largely exceeds the home production.

MANUFACTURES.

Although Montana has advantages that should cause it to become a great manufacturing state little has been done to utilize them. The smelting of copper ores, which is returned by the census as a part of manufactures, is regarded in Montana as a part of the mining industry, the matte turned out by the smelters being sent east to copper refineries. The Washoe smelter at Anaconda cost $7,500,00 and is the largest in the world. The smokestack of the Butte and Montana smelter at Great Falls enjoys the distinction of being the highest structure of its kind. Apart from

Billings Beet Sugar Factory.

the smelting of ores, however, there are few extensive manufactories, few manufactured products are exported, and the local demand is not supplied. For certain products made from Montana raw materials there is an unlimited market on the west coast, and because the people of Montana earn more per capita they have a greater purchasing power than a like number in any other state. The population, less than half a million at present, promises to grow to a million within a decade and the home market, now a fruitful field, is yearly becoming more worthy of cultivation.

The Billings Beet Sugar Factory and the Trident Cement Works are two large and successful manufactories that have been established within the past five years.

The flour milling industry has made a beginning and flour of excellent grade is made from home grown grain. Cereal foods are also produced on a small scale. The location and capacity of the flouring mills is shown in the following table:

LOCATION—	County.	Mills.	Daily Capacity Barrels.
Cascade	Cascade	1	100
Great Falls	Cascade	1	1,000
Joliet	Carbon	1	200
Fairview	Dawson	1	100
Lewistown	Fergus	1	250
Kalispell	Flathead	2	475
Columbia Falls	Flathead (1)	1	400
Jessup	Flathead	1	50
Bozeman	Gallatin	2	650
Belgrade	Gallatin	1	300
Manhattan	Gallatin	1	300
Springhill	Gallatin	1	75
Sheridan	Madison	2	175
Harlowtown	Meagher	1	300
Missoula	Missoula	1	100
Ronan	Missoula	1	40
St. Ignatius	Missoula	1	40
Hamilton	Ravalli	1	300
Plains	Sanders	1	100
Billings	Yellowstone	1	600
Total		23	5,555

(1) Not in operation.

In the leading wool state is the place for woolen mills; in the leading copper state is the place for copper wire mills and brass foundries. The place for flouring mills is where wheat is produced in the greatest quantity; and in ten years Montana may lead the United States in the amount of of wheat produced. Montana oats are sent thousands of miles to be manufactured into cereals; the finished product, not the raw material, should be shipped. Flax makes great yields, and where flax flourishes is the natural location for linseed oil mills to use the flaxseed and for manufactories of linen to usee the fibre. Peas and other vegetables reach such perfection in Montana that they are sent out of the state for use as seed; why should not canning factories be established to prepare these superior products for the markets of the world? When copper and steel and wool and linen are manufactured in Montana around these basic industries will grow up many manufacturing establishments for which they will supply the materials.

Boston & Montana Smelter at Great Falls.

The census office has issued a preliminary report on manufactures in Montana as follows:

The Thirteenth Census, like that of 1904, differs from the Twelfth Census in that the two later censuses excluded the hand and the building trades, and the neighborhood industries, and took account only of establishments conducted under the factory system. In the last census, also, as in that for 1904, statistics were

not collected for factories having a product for the census year of a value less than $500, except that reports were taken for establishments idle during a portion of the year 1909, or which began operation during that year, and whose products for such reason were less thain $500.

The word "establishment" as used in the Thirteenth Census means one or more factories, mills, or plants owned or controlled by a person, partnership, corporation, or other owner located in the same town or city and for which one set of books of account is kept.

The reports were taken for the calendar year ending December 31, 1909, wherever the system of bookkeeping permitted, but where the fiscal year of an establishment differed from the calendar year, a report of its operations was obtained for its fiscal period falling most largely within 1909.

The summary for the State, for most of the items, shows increases at the cen-

Cement Factory at Trident.

sus of 1909, as compared with that for 1904, exhibited in rate order as follows:

Number of establishments, 78 per cent; number of salaried officials and clerks, 63 per cent; cost of materials used, 38 per cent; average number of wage-earners employed during the year, 30 per cent; salaries andwages, 28 per cent; value of products, 21 per cent; and miscellaneous expenses, 16 per cent.

The smelting and refining of copper is the principal industry in the State and forms a large proportion of the total for all industries. The companies engaged in smelting also operate mines. Their method of preparing the census reports is largely a matter of bookkeeping, and the amounts charged to the census of manufactures, as distinct from that of mines, vary with changes in business methods. This fact should be considered in connection with the percentages of increase and decrease, as it accounts in part for the decrease of 15 per cent in capital and 5 per cent in the value added by manufacture.

There were 680 manufacturing establishments in 1909, and 382 in 1904, an increase of 298, or 78 per cent.

The capital invested, as reported in 1909, was $44,596,000, a loss of $7,994,000, or 15 per cent, as compared with $52,590,000 in 1904.The average capital per establishment for 1909 was approximately $66,000, and in 1904, $138,000. In this con-

nection it should be stated that the inquiry contained in the census schedule calls for the total amount of capital, both owned and borrowed and invested in the business, but does not include the value of rented property, plant, or equipment, which was employed in the conduct of manufacturing enterprises. In the final bulletins and reports the rental paid for such property will be shown separately.

The cost of materials used in 1909 was $56,363,000, as against $40,930,000 in 1904, an increase of $15,433,000, or 38 per cent. The average cost of materials per establishment in 1909 was approximately $83,000, and in 1904, $107,000. In addition to the component materials which enter into the products of an establishment for the census year there are included fuel, rent of power and heat, and mill supplies. The cost of materials, however, does not include unused materials and supplies bought either for speculation or for use during a subsequent period.

The value of products was $80,468,000 in 1909 and $66,415,000 in 1904, an increase of $14,053,000, or 21 per cent. The average per establishment was approximately $118,000 in 1909 and $174,090 in 1904. The value of products represents the product as actually turned out by the factories during the census year and does not necessarily have any relation to the amount of sales for that period. The values under this head also include the amount received for work done on materials furnished by others.

The value added by manufacture represents the difference between the cost of materials used and their value after the manufacturing processes have been expended upon them and they become products. The value added by manufacture was $24,105,000 in 1909 and $25,485,000 in 1904, a loss of $1,380,000, or 5 per cent. The value added by manufacture in 1909 formed 30 per cent of the total value of products, and in 1904, 38 per cent.

Miscellaneous expenses include rent of factory or works, taxes, and payments for contract work, which will appear separately in the final reports, and also such items of office and other expense as can not be elsewhere classified. The amount of these was $4,696,000 in 1909 and $4,052,000 in 1904, an increase of $644,000, or 16 per cent. The average miscellaneous expense per establishment was $7,000 in 1909 and $11,000 in 1904.

The salaries and wages amounted to $12,959,000 in 1909 and $10,158,000 in 1904, an increase of $2,801,000, or 28 per cent.

The number of salaried officials and clerks was 1,381 in 1909 and 905 in 1904, an increase of 476, or 53 per cent.

The average number of wage-earners employed during the year was 11,660 in 1909 and 8,957 in 1904, an increase of 2,703, or 30 per cent.

The comparative summary for the State, 1904 and 1909, follows:

	Census—		Per cent of increase 1904–1909.
	1909	1904	
Number of establishmentss	680	382	78
Capital	$44,596,000	$52,590,000	* 15
Cost of materials used	$56,365,000	$40,930,000	38
Salaries and wages	$12,950,000	$10,158,000	28
Miscellaneous expenses	$ 4,696,000	$ 4,052,000	16
Value of products	$80,468,000	$66,415,000	21
Value added by manufacture (products less cost of materials)	$24,105,000	$25,485,000	* 5
Employees:			
Number of salaried officials and clerks	1,381	905	53
Average number of wage-earners employed during the year	11,660	8,957	30

* Decrease.

The preliminary totals for steam laundries for Montana in 1909 are not included in the foregoing table, as the Thirteenth Census was the first at which they were canvassed. Therefore they are here given separately, as follows: Number of establishments, 26; capital, $677,000;; cost of materials used, $154,000; salaries and wages, $522,000; miscellaneous expenses, $88,000; value of products, $935,000; number of salaried officials and clerks, 47; and average number of wage-earners employed during the year, 652.

WORLD'S RECORD WHEAT YIELD.

THE MONTANA AGRICULTURAL EXPERIMENT STATION
Bozeman, Mont.

OFFICE OF DIRECTOR.

Oct. 28, 1911.

Mr. J. H. Hall,

Commissioner of A. L. I. & P.,

Helena, Montana.

Dear Mr. Hall:

You will undoubtedly be interested in learning of some large wheat yields on the experiment plots of the Station farm this season. The plots are 1/40 of an acre (one rod by four rods) with a road at each end, and a walk three feet between them. Field peas grew on the ground last year.

One plot seeded at the rate of two bushels per acre on April 6th yielded 131.5 pounds of Stanley wheat--equal to 87.6 bushels per acre.

Another plot seeded at the same rate on April 13th yielded 121.5 pounds of wheat--equal to 81 bushels per acre. These are the largest grain yields I have heard of, even for grain seeded in small plots.

Very truly yours,

F. B. Linfield

Director.

THE GROWTH OF AGRICULTURE.

The development that has been made of the mineral area is indicated by the statistics of mineral productions, and in the grazing area, the seat of the live stock industry, in the statistics of the census office that are printed on another page. The farming area is in such an early stage of development that in 1910 only one-fifteenth of the arable lands was in cultivation. The crop statistics point out what yields the lands now vacant may be expected to make when they are placed in cultivation. The farming industry, has however, made remarkable progress as the preliminary census report on farm statistics in Montana shows. The number of farms increased from 13,370 to 25,946 during the last decade, or 94 per cent, the value of farm lands and buildings 355 per cent, the value of all farm land alone 394 per cent, the total value of all farm buildings alone 164 per cent, the value of farm implements and machinery 187 per cent, the total acreage 62 per cent, the improved acreage 110 per cent, the average value per acre of farm lands and buildings 182 per cent, and the average value per acre of farm lands alone 205 per cent. The total acreage reported was 13,499,000 in 1910 and 8,344,000 in 1900; the improved acres were 3,631,000 in 1910 as against 1,726,000 in 1900; and the average value per acre of farm land for 1910 is given as $18.56 as against $6.59 in 1900. A later report states that the farms in Montana number 26,214 of which 8,970 are irrigated. The unirrigated farms, therefore, number 17,244. Future reports may slightly modify the statistics in this preliminary report which is reproduced below as it appeared in the Twelfth Report of the Bureau of Agriculture, Labor and Industry:

Washington, D. C., February 25, 1911.—Census Director Durand issued today the first official statement from the Census Bureau relative to the agricultural statistics of the state of Montana collected at the Thirteenth Decennial United States Census, April 15, 1910.

It is based on a preliminary comparative summary of the division to the Director by Dr. Le Grand Powers, chief statistician of the division of agriculture in the Bureau of the Census. This summary shows, for both the census of 1910 and that of 1900, the reported total value of farm land, buildings, implements, and machinery; total acreage; improved acreage; average acres per farm; average value per acre of farm land and buildings; average value per acre of farm land alone; and the aggregate expenditures for labor and fertilizers. It also distributes the total number of farms according to color of farmer; specified character of tenure; whether held free or mortgaged by owners, and by certain acreage groups.

The Director gives notice that the summary's figures are subject to revision later, owing to the fact that a number of farms whose returns are incomplete will be included in the final tables. These additions will not, in all probability, modify any of the amounts or rates contained in the present statement.

The Crow Indian Land.

It is also explained in the summary that the figures include an area of 3,500,000 acres in the Crow Indian Reservation, which in 1900 was occupied for grazing purposes by a corporation that had leased the land from the Indians. No such lease

existed in 1910, although at the time the census was taken only a small portion of the reservation was used for agricultural pursuits. For purposes of comparion totals for 1900 are given, inclusive and exclusive of this land.

The census of agriculture was taken primarily for the purposes of obtaining an accurate inventory of all classes of farm property existing on April 15, 1910; a complete exhibit of farm operations during the year ended December 31, 1909; and a statement of the number and value of domestic animals in cities and villages on April 15, 1910.

Statements relative to the acreage and yield of crops and domestic animals of Montana will be issued by Director Durand as soon as the tabulation of this data has been completed.

The Per Cent of Increase and Decrease.

It is pointed out in the statement today that the principal rates of increase in Montana in 1910, as against 1900, are: In the total value of all farm land alone, 394 per cent; in the total value of farm land and buildings, 355 per cent; in the average value per acre of farm land alone, 205 per cent; in the total value of all farm implements and machinery, 187 per cent; in the average value per acre of farm buildings, 182 per cent; in the total value of farm buildings alone, 164 per cent; in the total expenditures for fertilizers, 150 per cent; in the total expenditures for labor, 114 per cent; in the total improved farm acreage, 110 per cent; in the whole number of farms, 94 per cent; and in the total farm acreage, 62 per cent.

Cascade County Grasses.
Grown by Mrs. E. S. Tolliver of Belt Park.

The only decrease during the decade occurred in the average acres per farm, 17 per cent. The statement shows in detail that the number of farms reported in 1910 was 25,946, as compared with 13,370 in 1900, an increase of 12,576, or 94 per cent. The total value of farm land and buildings was given in 1910 as $250,845,000, as against $55,026,000 in 1910, an increase of $195,459,000, or 355 per cent.

Farm Land Values.

The total value of all farm land alone was reported in 1910 as $225,819,000, as compared with $45,686,000 in 1900, a gain of $180,133,000, or 394 per cent. The total value of all farm buildings alone was given in 1910 as $24,666,000, as against $9,340,000 in 1900, an increase of $15,326,000, or 164 per cent. In 1910 the value of the farm land alone constituted 90 per cent of the total value of land and buildings, as compared with 83 per cent in 1900. The reported value of farm implements and machinery was $10,522,000 in 1910, as against $3,672,000 in 1900, a gain of $6,850,000, or 187 per cent. The total acreage reported in 1910 was 13,499,000 acres, as compared with 8,344,000 in 1900, an increase

of 5,155,000 acres, or 62 per cent. The improved acreage was returned in 1910 as amounting to 3,631,000 acres, as against 1,726,000 in 1900, an increase of 1,905,000 acres, or 110 per cent. The improved acreage formed 27 per cent of the total acreage in 1910 and 21 per cent in 1900. The average acres per farm reported in 1910 was 520, as against 624 in 1900, a decrease of 104 acres, or 17 per cent. The average value per acre of farm land and buildings in 1910 is stated as $18.56, as against $6.59 in 1900, a rise of $11.97, or 182 per cent. The average value per acre of farm land alone in 1910 was reported as $16.73, while in 1900 it was $5.48, the amount of gain being $11.25, or 205 per cent.

A Garden at Troy.

Farm Ownership.

Of the whole number, 25,946, of farms reported in 1910 there were 24,752, or 95 per cent, operated by white farmers and 1,194, or 5 per cent, by colored, as compared with a total of 13,370 in 1900, of which 13,042, or 98 per cent, were conducted by white farmers and 328, or 2 per cent, by colored. The increase in the number of farms of white farmers during the decade amounted to 11,710, and in the number of farms of colored farmers to 866. The total number of farms operated in 1910 by owners, part owners, and owners and tenants, comprising the "all owners" class, was 23,125, as compared with 11,661 in 1900, an increase of 11,464. The total number of farms conducted in 1910 by cash tenants, share tenants and cash and share tenants, comprising the "all tenants" class, was 2,323, as against 1,230 in 1900, an increase of 1,093. The total number of farms operated by managers in 1910 was 498 as compared with 479 in 1900, an increase of 19. The total number of farms operated by the "all owners" class constituted 89 per cent of the whole number of farms in 1910, and 87 per cent in 1900; those operated by the "all tenants" class, 9 per cent in both 1910 and 1900; and those conducted by managers, 2 per cent in 1910 and 4 per cent in 1900. Of the total number, 23,125, of farms operated in 1910 by the "all owners" class, there were 4,794, or 21 per cent, reported as

mortgaged while 18,331, or 79 per cent, were reported as "owned free of debt." There were 499 farms for which no mortgage report was secured, and these are included in the farms free from debt. In 1900 information was secured concerning the "owned farm homes." At that time, 1,608, or 13 per cent, were reported as mortgaged, while 10,356, or 87 per cent, were free from debt. There were 498 in 1900 for which no mortgage report was secured, which were included in the farms free from debt. The Census Bureau has no information respecting the number of mortgaged farms leased to tenants.

Harvesting Potatoes.

Distribution According to Acreage Groups.

The statement relative to farms distributed according to certain acreage groups shows that those of 19 acres and under numbered 724 in 1910 and 653 in 1900, a gain of 71; of 20 to 49 acres, 939 in 1910 and 339 in 1900, an increase of 540; of 50 to 99 acres, 1,247 in 1910 and 563 in 1900, an increase of 684; of 100 to 174 acres, 10,394 in 1910 and 5,613 in 1900, an increase of 4,781; of 175 to 499 acres, 8,299 in 1910 and 3,596 in 1900, an increase of 4,703; of 500 to 999 acres, 2,347 in 1910 and 1,257 in 1900, an increase of 1,090; and of 1,000 acres and over, 1,996 in 1910 and 1,289 in 1900, a gain of 707.

Acreage Group Proportions.

Of the whole number of farms, those of 19 acres and under formed 3 per cent in 1910 and 5 per cent in 1900; those of 20 to 49 acres, 4 per cent in 1910 and 3 per cent in 1900; those of 50 to 99 acres, 5 per cent in 1910 and 4 per cent in 1900; those of 100 to 174 acres, 40 per cent in 1910 and 42 per cent in 1900; those of 175 to 499 acres, 32 per cent in 1910 and 27 per cent in 1910; those of 500 to 999 acres, 9 per cent in both 1910 and 1900; and those of 1,000 acres and over, 7 per cent in 1910 and 10 per cent in 1900.

The expenditures for labor in 1910 reached the sum of $10,874,000 as compared with $5,077,000 in 1900, an increase of $5,797,000, or 114 per cent. The expenditure for fertilizers amounted in 1910 to $10,000 while in 1900 it was $4,000, a gain of $6,000 or 150 per cent.

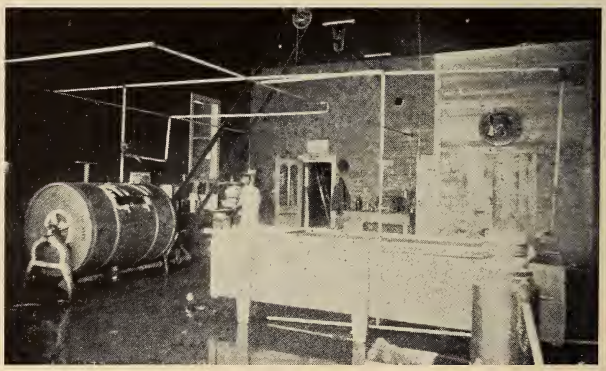
Summary for the State.

The preliminary comparative summary follows:

ALL FARMS BY ACREAGE, VALUE OF LAND, BUILDINGS, IMPLEMENTS, ETC.

	1910.	1900.	Per Cent of Increase 1900–1910.
All farms	25,946	13,370	94
Total acreage	13,499,000	*11,844,000 †8,344,000	62
Improved acreage	3,631,000	*1,737,000 †1,726,000	110
Average acres per farm	520	†624	‡17
Value of land and buildings	$250,485,000	*$62,026,000 †$55,026,000 *$52,661,000	355
Value of land	$225,819,000	†$45,686,000	394
Value of buildings	$24,666,000	*$9,365,000 †$9,340,000	164
Value of Implements and machinery	$10,522,000	$3,672,000	187
Average value per acre of land and buildings	$18.56	†$6.59	182
Average value per acre of land alone	$16.73	†$5.48	205
Expenditures for—			
Labor	$10,874,000	$5,077,000	114
Fertilizers	$10,000	$4,000	150

*Includes land on Indian reservation in Rosebud and Yellowstone counties.
†Exclusive of land on Indian reservation in Rosebud and Yellowstone counties.
‡Decrease.



Interior of Philipsburg Creamery.

From 1900 to 1910 the acres in wheat increased from 72,555 to 480,000, the yield from 1,929,963 bushels to 10,560,000, and the value of the crop from $1,177,277 to $9,081,000. The government's preliminary estimate of the yield in 1911 is 16,919,000 bushels.

From 1900 to 1910 the acres in oats increased from 65,865 to 350,000, the yield from 2,368,735 bushels to 13,300,000, and the value of the crop from $1,078,869 to $6,118,000. The government's estimate of the yield of 1911 is 19,090,000 bushels.

From 1900 to 1910 the acres in barley increased from 5,194 to 52,000, the yield from 201,527 bushels to 1,456,000, and the value of the crop from $96,733 to $903,000. The government's estimate for 1911 is a yield of 1,934,000 bushels from 53,000 acres.

From 1900 to 1910 acres in hay increased from 369,161 to 600,000, the yield from 580,658 tons to 840,000 tons, and the value of the crop from $5,138,725 to $10,500,000. The government's estimate for 1911 is a yield of 1,244,000 tons from 612,000 acres.

Flaxseed increased from an acreage of 9,000 in 1900 to 60,000 in 1910. In 1911 the acres harvested may exceed 300,000.

The increase in wheat in 1911 over 1910 was 64 per cent, in oats 43.5 per cent, in barley 32.8 per cent, and in hay 45.7 per cent.

From 1900 to 1911 production of the principal crops increased as follows: Wheat 776 per cent, oats 643 per cent, barley 859 per cent and hay 110 per cent.

The development of farming is further shown by the following item from the Helena Record.

In the first twenty days of October, 1910, the Great Northern hauled from stations in Montana to eastern points 75,000 bushels of grain. In the first twenty days of October, 1911, that railroad has carried out of the state 800,000 bushels. It is the estimate of the trafic department that this year the Great Northern will carry out of the state 3,750,000 bushels of grain, compared with less than 2,500,000 bushels last year. In the opinion of the Great Northern officials the grain output of Montana next year will more than double that of this year.

Dairy Herd in Deer Lodge County.

MINOR FARM INDUSTRIES.

Sugar Beets—Dairying—Raising Hogs—Poultry and Eggs—Honey—Local Market.

Statistics of crop production contained in another part of this volume and the census reports on farm statistics for the last decade, are based chiefly on the principal crops, grain and hay. Minor farm industries are growing sugar beets, dairying, hog raising, poultry, honey making, and horticulture.

Experiments made in many districts have proved that the soil and climate of Montana are well adapted to growing sugar beets. The saccharine strength is uniformly high, and as many as twenty tons have been raised on one acre. The crop is a profitable one wherever there is a sugar factory convenient; and there are those who say that to feed beets to stock is not less profitable than to sell them. At Billings is the only factory in the state, but it is expected that when the irrigated lands of the Sun river and Milk river valleys are settled upon sugar beets will become a leading crop and will be purchased by factories to be erected at convenient places.

The Billings beet sugar factory was constructed in 1906 at a cost of $1,250,000, has a capacity of 1,000 tons a day, employs 450 persons during the operating season and 125 persons for the whole year. The plant is operated by steam power and annually uses 35,000 tons of coal. The pulp left after the extraction of sugar is a valuable food for fattening stock. Beet tops have also a value as a stock food.

The factory bought the beet crop from 7,000 acres the first year it was in operation, and has been steadily increasing its supply. During the year 1911 the product of about 15,000 acres were handled and about $800,000 paid for beets. The price paid is based on saccharine strength, the grower commonly receiving about five dollars a ton for beets delivered at the receiving station. The average yield is about fifteen tons an acre; the gross yield of an acre of sugar beets is generally about seventy-five dollars and the net yield about forty dollars. The business has been profitable both to the growers and to the owners of the factory, and its establishment has caused a decided advance in land values in the districts where the beets are grown, has given a new and large pay-roll to Billings, and has aided in the development of the surrounding country.

The minor farm industries do not grow into importance until after a country has been well established as a farming region. For the dairying industry, for example, Montana has advantages that few states possess yet the dairy products manufactured in the state do not supply one half of the demand. About forty creameries have been built and the number will be increased as more farmers become interested in this profitable branch of agriculture. Butter fat sells at prices ranging from 19 to 35 cents a pound

and farmers have found that good dairy cattle are good dividend payers. The Montana Dairyman's Association is doing excellent work in promoting the extension of this industry.

Joel J. Winkler, an expert on dairy products in the Department of Agriculture, made the following remarks on the advantages of Montana as a dairy state during a recent visit:

"I have been with the Department of Agriculture for a long time and have been inspector of dairy products in several different states, but I have never had experience with as good products as the farmers have in this state. The cream is without an equal in the United States. I attribute this to the very favorable seasons and other climatic conditions of Montana. The water is cold and pure, the forage is excellent, and a dry climate prevents the various forms of disease so common in some of the eastern states. In my trip I only saw one cause that tends to keep down the dairy industry, and that is inefficient help in the creameries and dairy supply houses. The people will have to get educated to hiring only those butter makers who are competent to get the best results from the machinery.

With the natural conditions favorable for the best curing of hay, with the excellent water supply that can be found, and the transportation facilities as they are found in the Bitter Root, Gallatin and Yellowstone valleys, I look for Montana to be, perhaps, the greatest dairy state in the United States in the course of the next few years."

Polander.

Last May announcement was made at Bozeman that Polander, a Jersey cow belonging to the Montana Agricultural Experiment Station, had made a new world's record for milk and butter production. Polander's record for the week ending at noon May 21, 1911, was 450.2 pounds of milk, and 21.25 pounds of butter fat. When Polander was purchased in Minnesota she did not give promise of becoming a record breaker. She was brought to Montana, her condition improved, and the yield of milk increased until it culminated in the remarkable record that is set forth below:

Date.	Pounds Milk.	Pounds Butter-Fat.	Date.	Pounds Milk.	Pounds. Butter-Fat.
May 15	64.4	2.8776	May 19	64.8	3.1285
May 16	61.6	3.1188	May 20	64.6	2.8396
May 17	63.1	3.2505	May 21	66.8	2.9661
May 18	64.9	3.0644			
			Seven days	450.2	21.2460

R. W. Clark, professor of animal husbandry at the Montana Agricultural College, says concerning this record:

"The following table givess the record of this cow compared with the butter fat produced in seven days by the three best cows reported in the Jersey Register of Merit for 1909.

	Polander.		Jacoba Irene.		Double Time.		Lolette's Prize.	
	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.
Milk	450	3.2	444	6.4	410	14.4	300	14.4
Fat	21	3.2	20	8.8	20	6.2	18	14.7

Polander's highest weekly record was 456 pounds.

Lolette's Prize is owned by Dr. W. P. Mills of Missoula, Montana. Therefore shse and Polander made their records with Montana foods and under Montana conditions. Polander had an excellent quality of clover and alfalfa hay at all times and silage during the winter. The forepart of the winter she received clover silage and the latter part immature corn silage. The ration was home grown except the small amount of corn it contained."

George Wilcomb, of Pageville, Madison county, a rancher who owns a dairy herd of twenty cows, shipped to Butte and sold during March, 1911, two hundred and fifty gallons of sweet cream for which he was paid two hundred and twenty-five dollars, or at the rate of more than eleven dollars for each cow. The correspondent who furnishes this account says:

Two years ago Mr. Wilcomb, did not believe there was any money to be made in keeping a dairy, and in fact so keen was his dislike to having a cow around the place that he invariably took condensed milk in his tea. Now he is making more money out of cows than several other things on his ranch combined and admits that dairying in Montana is one of the most profitable branches of farming.

Montana imported great quantities of hog products that should be produced within the state. Growing hogs is a safe industry, the climate being unfriendly to diseases. Corn is not commonly used for fattening nor is it needed. James J. Hill said at the Montana State Fair of 1909:

"If you want to feed livestock and put your cattle and hogs in the very prime of condition, remember that with alfalfa and barley you can make as good beef and as good pork as ever was offered anywhere. The best hams in the world are known as Westphalia hams, and my German friends here know that there never was a kernel of corn fed in Westphalia. Wiltshire bacon in England commands a fancy price, and there never was any corn fed hogs in Wiltshire."

Some Mortgage Lifters.

The following editorial in the Butte Miner bristles with reasons why farmers should grow more hogs:

Hog raising in Montana is becoming a very profitable business among those farmers who believe in the diversified agriculture. There is no doubt that in the future this state will become famous for itss pork products.

Corn makes good lard, but it does not make the best bacon or ham. There are certain counties in England that are famous for their bacon, among their number being Wiltshire; and although Wiltshire bacon is known all over the world no pig in that county ever ate a grain of corn.

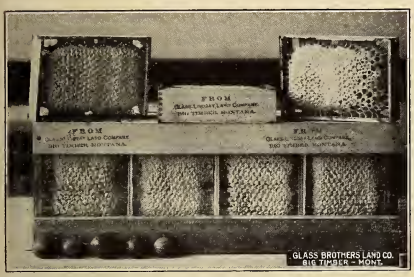
Alfalfa, barley meal, and peas and other ground food, are usually fed to hogs in Montana and this feed makes the best flavored pork that can be found anywhere. Swine fed upon these products of the soil are not all fat, but have a large proportion of lean, and the more lean there is in bacon in proportion to the fat, the better it is. It is one of the possibilities of the future that Montana pork will be in

great demand in the east and bring a far higher price than the corn fed pigs in the middle states. It is likely that Montana hams will compete with the famous razor-back ones of some of the southern states. There is a great opportunity for the development of this industry in this state.

Splendid specimens of swine that were shown at the Montana State Fair in 1911 were taken to the great fair at Spokane and won first prizes.

The local production falls far short of supplying the demand for eggs and chickens. Flocks of all standard varieties are owned, and there is a State Board of Poultry Husbandry of which W. F. Schoppe of Bozeman is secretary. The census statistics relating to poultry are contained in the report of domestic animals.

Bee keeping is an industry that is successful at many places; but nearly all the honey consumed is imported, the local product finding a ready sale at the nearest town.



Sweet Grass County Honey.

The large number of men engaged in the mining industry, or dependent upon it, consume a large part of the products of the soil. The home market their needs provide is one of the most important advantages the farmers and fruit growers of Montana possess. Their prosperity and that of the tillers of the soil, are, in a measure linked together. Lesser industries also add to the home demands. Every city and distributing point receives each month many carloads of food stuffs imported from outside the state which could be produced within it. Some idea of the magnitude of the demand that home production has been unable to meet may be had from the following table, that is based on the latest available figures. The items were obtained from the actual freight bills at the leading railway stations for the year 1906 and express in pounds a part of the products imported:

FARM PRODUCTS (POUNDS) IMPORTED INTO MONTANA IN 1906 AS SHOWN BY FREIGHT BILLS AT LEADING STATIONS.

Potatoes	10,374,387	Onions	1,475,609
Mixed Vegetables	2,997,801	Cabbage	1,645,039
Asparagus	19,678	Celery	74,871
Green peas	13,133	Green beans	12,036
Lettuce	3,393	Green corn	15,774
Rhubarb	42,085	Cucumbers	42,395
Tomatoes	463,660	Spinach	5,849
Eggs (dozen)	4,056,360	Squash	4,726
Carrots	4,715	Beets	2,670
Horseradish	4,430	Turnips	13,276
Dried peas	2,024	Dried beans	1,189,654
Clover seed	105,114	Flax seed	6,060
Millet	25,010	Alfalfa seed	83,446
Barley	145,200	Oats	332,340
Wheat	18,239,150	Malt	1,269,549
Mixed pickles	1,429,878	Ham	7,222,021
Bacon	3,617,177	Cured meats	552,467
Fresh pork	2,597,577	Other fresh meats	3,139,421
Condensed milk	899,985	Butter	4,350,954
Oleo and butterine	700,065	Cheese	751,366
Poultry	3,024,837	Lard	1,888,620

Total value of importations about $6,500,000.

HORTICULTURE.

Vegetables—Fruits—Apple Production.

All vegetables that grow in northern latitudes make remarkable yields. Excellent celery is grown in many counties; a cabbage weighing 40 pounds was raised near Ronan, Flathead county, in 1911; seventy potatoes were found in one hill in Lincoln county; a pumpkin 90 pounds in weight was a product of Custer county; 50 diners at a hotel in Teton county were served parts of one turnip; watermelons of large size grow in the eastern part of the state, and canteloupes in Carbon county that equal those shipped from Rocky Ford, Colorado.

Fruits.

The growing of fruits on a commercial scale is the most important branch of horticulture and its importance has been recognized by the creation of the State Board of Horticulture of which the governor is, ex-officio, a member. The other members are selected "with reference to their study of, and practical experience in, horticulture and in the industries dependent thereon." The board maintains an office at Missoula and has issued reports containing information of much practical value. The secretary, M. L. Dean, is an authority on fruit growing and may be consulted by those who wish to learn about Montana's advantages as a fruit-growing region.

Pears and a Silver Dollar.

The Montana Horticultural Society was organized in 1898, has for its mission the development of the fruit industry, and holds annual meetings whose proceedings are printed. The secretary is Prof. M. J. Elrod of Missoula. "Horticulture in its broadest sense, has passed the experimental stage," says the foreword of the report of the proceedings of the society for 1908. "Gardens are in every valley; small fruits supply a large portion of the demand of the markets. Apples, plums, pears, and cherries are shipped by the thousand boxes or crates. Millions of trees are on the road to bearing, and thousands are being set out annually. And yet there is room. Land set out in fruit or orchards soon doubles in price. Irrigation makes the crop as certain as the rotation of the earth upon its axis. When the industrious horticulturist can work a few years to take care of his orchard until it produces fruit, and then sit in the shade, if he is so inclined, while his fruit grows, and his money comes in, it is proof that the old times have passed away."

From the Fifth Biennial Report of the State Board of Horticulture a number of very interesting facts are taken. During the year 1907 a total of 361,408 fruit trees of all kinds were shipped into the State, while the

Bench Land Apples in Sweet Grass County.

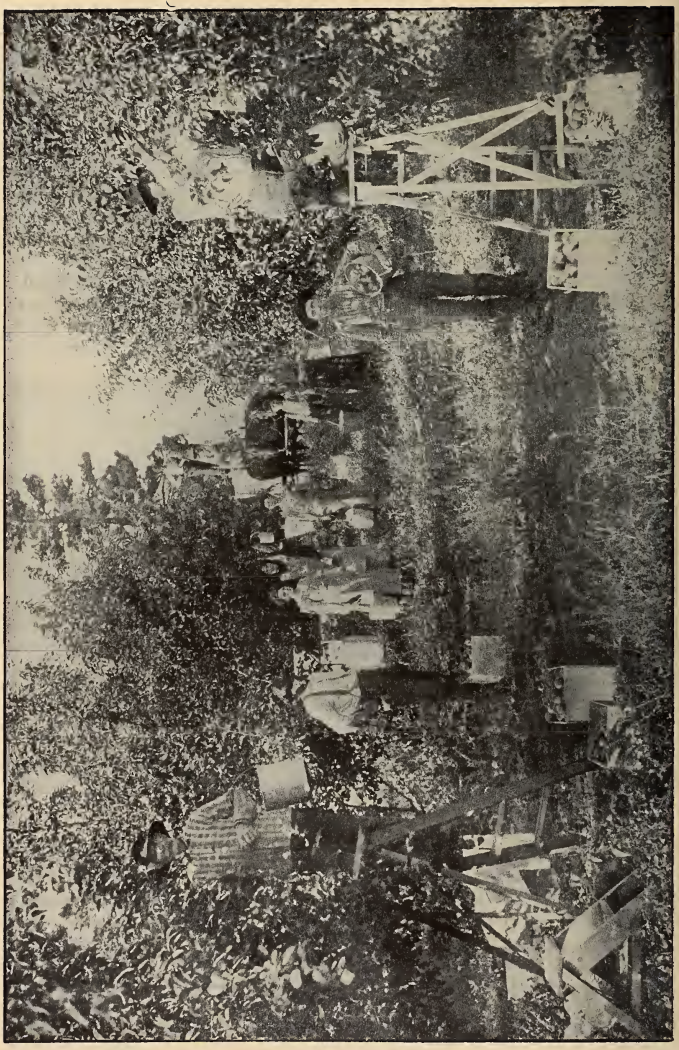
number for 1908 was 446,500, making the enormous total for the two years of 807,908. Besides these, no less than 782,000 trees were inspected in local nurseries. These figures, which do not include trees privately propagated, give some idea of the rapid progress of horticulture in Montana and direct attention to the future greatness of this industry.

Aside from the fruit trees which embrace apple, pear, peach, plum, prune, cherry, apricot, and quince trees, there were 21,839 shade, evergreen and ornamental trees, shrubs, roses and bulbs imported during the two years as well as 646,323 small fruit plants. The latter include black and

Garden Products from Ronan. Missoula County.

dewberries, raspberries, mulberries, currants, gooseberries, strawberries, grapes and high bush cranberries. As showing the market in Montana for fruit and berries, it is stated that during 1907 and 1908 not less than 1,301 carloads of these products were inspected. This involved handling the enormous total of 1,008,435 packages, of which 187,442 were local freight and express shipments in Butte.

The inspection of all fruit resulted in the condemnation of 3,810 packages, which were destroyed by the inspectors. It is also shown that 190 acres of land owned and operated by Montana nurseries were inspected and found to be entirely free from pests and diseases. The number of



Where Fruit Pests are Unknown.

small plants inspected in these institutions is given at 185,000, and the trees at 782,000. The report of the board contains much valuable information, including an article by Hon. Fred Whiteside, the former secretary, on Dry Land Fruit Culture. There are instructions on planting, pruning and care of orchards; methods of packing fruit, and many recipes for mixing and applying sprays for the destruction of pests.

From the Sixth Biennial Report of the Board of Horticulture it appears that 1,209,197 fruit trees and plants were shipped into Montana and inspected in 1909, and 2,015,896 in 1910. The packages of fruit inspected numbered 721,139 in 1909 and 832,339 in 1910. In regard to nurseries the report says:

> Montana has eleven licensed nurseries, comprising about five hundred acres. Many of the large orchard companies and leading orchardists are growing their own nursery stock, which would add materially to the above area. The output for 1911 will be about 3,000,000 apple trees, 80,000 plum and cherry trees, 40,000 pear trees; other fruit trees and small fruits 66,000 and 207,000 ornamentals, besides much stock handled through the jobbing trade.

Apple Production.

The fruit industry is in its infancy and the home production furnishes only a small part of the amount consumed. Every part of the state is adapted to fruit of one kind or another but there are so many different conditions owing to the differences in soil, drainage, climate and altitude that a kind of fruit or a variety that will succeed at one place may fail at another. In certain districts all the conditions for growing perfect fruit are known to be present; and after years of experimental work the varieties that are best adapted to these districts have been determined and cultivation on a commercial scale is chiefly confined to them.

The McIntosh Red apple is the variety raised in greatest quantity but many other varieties do equally or almost as well. A difference, too, is in the method of cultivation. Orchards are usually irrigated, but in the Flathead fruit districts irrigation is not necessary. Apples are the leading fruit crop; crab apples yield abundantly and are profitable; pears thrive at many places; peaches and grapes have been grown in certain orchards, but the area suited for their profitable production will have to be determined by further tests. Cherries are among the most profitable and satisfactory of fruit crops. The fruit is large and firm, ripens at a time when cherries from other states have ceased to be on the market, and stands shipment to distant points.

Strawberries and raspberries, gooseberries and currants are grown in nearly every community but the supply rarely meets the local demand. Though several hundred carloads of apples and cherries are yearly shipped from Montana, some of the fruit going to foreign countries, home grown fruit and berries are never on sale at many places in the state. The local demand is far greater than the local supply.

The principal fruit districts are in Ravalli, Missoula, Sanders, Flathead, and Lincoln, counties in the western part of the state where the industry has been established for many years, and in Yellowstone and Carbon counties in the eastern part. The acreage in fruit trees is approx-

imately as follows: Ravalli, 30,000; Missoula, 7,500; Sanders, 1,000; Flathead, 10,000 and Carbon 15,000. In other counties are successful orchards, and in some districts large numbers of trees have been planted. Experiments made in growing apples in Granite, Madison, Gallatin, Park, Sweet Grass, Custer, Fergus, Broadwater, Jefferson, Lewis and Clark, and Cascade counties, indicate that apples, and perhaps other fruits, may be grown on a commercial scale over a large extent of Montana; but in neither of these counties has the industry yet become a leading one nor are the districts in which it may be profitably followed determined. Apple trees may also be found bearing good crops at many country homes in the counties that have not been named.

The fruit-growing industry is increasing every year and offers almost unlimited opportunities for expansion. None of the eally proven fruit districts is in more than a preliminary stage of development and the returns that bearing orchards yield are sufficiently great to satisfy any investor. In the business of fruit growing Montana offers opportunities for profitable and congenial occupation for a great many people.

The demand for apples is yearly increasing; and, although many trees have been set out in recent years experienced judges have no fear that apples of the grade produced in this state will ever fail to find a ready sale at a good figure. The production of apples in Montana has grown from 5,896 boxes of the value of $6,485 in 1890 to 615,000 boxes of the value of $675,000 in 1910. The official figures of apple production in the United States from 1895 to 1907 are as follows:

Year.	Barrels.	Year.	Barrels.
1895	60,540,000	1903	45,000,000
1896	69,070,000	1904	45,300,000
1897	41,536,000	1905	23,500,000
1898	28,570,000	1906	36,130,000
1899	37,560,000	1907	18,000,000
1900	47,960,000	1908	(1) 25,450,000
1901	26,970,000	1909	(1) 22,735,000
1902	47,625,000		

(1)—Estimated.

The orchardists of Montana recognize the necessity of establishing and maintaining a reputation for their fruit and of insuring proper inspection, sorting, grading and packing; and to secure these objects the Bitter Root Fruit Growers' Association and the Flathead Fruit Growers Association were organized in 1907. Both have done much good in promoting the marketing of fruit to advantage.

A Montana Apple Tree.

Montana apples have beauty of color, size, and quality that have given them a great reputation. In one important respect they surpass all other ap-

ples; the Montana apple has no worm in it and for this reason is the only apple that may be eaten in the dark with perfect safety.

A Flathead County Plum Tree.

New York Herald, of October 8, 1911, refers in the words that follow to Montana apples:

"New York, the greatest apple market in the world, will have this season a new source of supply, the Bitter Root valley of Montana, in the 'Great Divide.' It was from this valley that New York got a sensation in mid-August by the arrival of a carload of 'Bing' cherries, big as plums, three weeks after the regular season for the fruit closed here."

"The large wormless red apples of the McIntosh variety are to be the next sensation. They are being rushed across the continent and are expected to bring as high as $4 a standard box at wholesale. It is estimated that the valley will ship to New York fully 300 cars of the fruit during the season."

"Attention of French and English buyers has been attracted to the Bitter Root valley, as a record crop is being harvested there. The exact extent of the crop has not been estimated, but it is of such a character as to produce joy in the trade, in view of the shortage in fancy varieties of the fruit in the unirrigated districts. The apple growers of the Bitter Root district are expecting to reap a fortune from their yield. New York will have much competition in getting the lion's share of the Bitter Root product. Big shipments to England and continental countries are anticipated."

MONTANA'S BEST CROP

GROWTH OF POPULATION AND PROPERTY.

Population of Cities and Counties—Assessed Valuations—Resources of Banks—One Year's Production—The State's Balance Sheet.

The population of Montana was 20,595 in 1870; 39,159 in 1880; 132,159 in 1890; 243,329 in 1900; and 376,053 in 1910. The percentage of increase for the decade was 54.5. The number of persons to the square mile was 1.0 in 1890, 1.7 in 1900, and 2.6 in 1910. A greater development has taken place in Colorado and has resulted in attracting to that state a population of 7.7 persons to the square mile; if Montana were as densly settled the population would be 1,128,000. When Montana attains a density of population equal to that of Idaho in 1910 there will be 571,630 people in the state, and when it equals Washington in this respect the population will be 2,506,000. When it has as many persons to the square mile as North Dakota had last year the population will be 1,202,000. These figures show how far behind other states that are smaller in area and certainly are not possessed of superior advantages Montana has been in attracting settlers to its rich domain. Minnesota is not thickly settled but if there had been last year as many persons to the square mile in Montana as there were in Minnesota the population would have been 4,529,000. Montana has the resources to employ and sustain millions of people; and, as in this age of rapid transportation and of hunger for land it is possible for a new region to achieve as much development in the space of ten years as was formerly possible in thirty years, it would not be surprising if the population of Montana in 1920 should approximate one million.

"In all but two states—Montana and Wyoming," says the census report on urban and rural population "the urban population has increased faster than rural population, and generally at a very much more rapid rate." Urban population is that residing in cities or other incorporated places of 2,500 inhabitants or more. The rural population of Montana was 242,633 in 1910 and the urban population 133,420. During the decade the urban population increased 49.1 per cent and the rural 57.7 per cent.

The following table gives the population of cities and towns that were incorporated in 1910:

POPULATION OF CITIES.

Name.	1910.	1900.	Name.	1910.	1900.
Anconda	10,134	9,453	Kalispell	5,540	2,526
Bear Creek	302		Laurel	806	
Belgrade	561		Lewistown	2,992	1,096
Belt	1,158		Libby	630	
Big Timber	1,022		Livingston	5,359	2,778
Billings	10,031	3,221	Malta	433	
Bozeman	5,107	3,419	Miles City	4,697	1,933
Bridger	514		Missoula	12,869	4,366
Butte	39,165	30,470	Moore	573	
Chinook	780		Neihart	268	833
Columbia Falls	601		Philipsburg	1,109	995
Columbus	521		Plains	481	
Conrad	888		Pony	369	
Culbertson	528		Red Lodge	4,860	2,152
Deer Lodge	2,570	1,324	Roundup	1,513	
Dillon	1,835	1,530	Sheridan	399	581

Name.	1910.	1900.
Eureka	603	
Forsyth	1,398	
Fort Benton	1,004	1,024
Glasgow	1,158	
Glendive	2,428	
Great Falls	13,948	14,930
Hamilton	2,240	1,257
Harlem	383	
Harlowton	770	
Havre	3,624	1,032
Helena	12,515	10,770
Joliet	389	

Name.	1910.	1900.
Stevensville	796	346
Thompson Falls	325	
Three Forks	674	
Townsend	759	446
Twin Bridges	491	
Victor	374	136
Virginia City	467	568
Walkerville	2,491	2,631
White Sulphur Springs	417	446
Whitefish	1,479	
Whitehall	417	
Wibaux	487	

Polson claiming a population of nearly 2,000, Ronan, Valier, Cascade, and Manhattan are growing towns that are not in the list.

The correctness of the census returns of the population of the cities of Montana has been doubted in nearly every instance. Not included in the population of Butte is a large number of people who practically reside in that city although dwelling outside the legal limits of the municipality, and not only was a populous suburb excluded in counting the population of Great Falls but the statement is made that many persons that resided within the city's limits were not counted. A recount was asked for and denied though there is no doubt that Great Falls made a substantial growth in population between 1900 and 1910.

When the territory of Montana was established in 1864 the population resided almost wholly in the western part. Virginia City was the chief town; Bannack was a lively mining camp, and Deer Lodge and Missoula were trading places. Last Chance gulch, the site of Helena, was on the eve of development: Fort Benton was the terminus of the steamboat line on the Missouri river; stage stations were placed at convenient distances on the main routes of travel and many prospectors had gone into the hills; northwestern Montana and all of eastern Montana were in the possession of the several Indian tribes who divided the country amongst themselves. There was nothing to indicate that prosperous towns and large cities would grow up where now are Anaconda, Billings, Bozeman, Butte, Great Falls, Havre and Kalispell. The hope of the seekers was to gain quickly a fortune and to return to their homes. Not until quartz mining, stock growing and farming began was the idea of making Montana a permanent place of abode entertained by more than a few of the pioneers. The absence of railroads and the presence of hostile Indians delayed the extension of stock growing, but after years of waiting the railroad came, and from time to time Indian reservations have been ceded, in whole or in part, and large areas of desirable lands opened to settlement. Indian reservations now existing are too large for the purpose for which they were set aside and in the course of a few years will, no doubt, be opened to settlement.

When the territorial government was organized the area was divided into the nine counties of Beaverhead, Big Horn, Chouteau, Deer Lodge, Edgerton, Gallatin, Jefferson, Madison and Missoula. The original counties were of great size and it became necessary to create new ones as settlewere extended. The nine counties have grown to twenty-nine; and in the cases of Edgerton that embraced what is now Lewis and Clark and Big Horn out of which has been formed several counties in the lower

Yellowstone valley, the original names have disappeared. Since the census was taken in 1910 the county of Musselshell has been established and a law has been passed prescribing a manner in which counties may be established by a vote of the inhabitants of the area affected.

The growth of the several counties in population is shown in the following table:

THE POPULATION BY COUNTIES.

County.	County Seat.	Population. 1900.	1910.
Beaverhead	Dillon	5,615	6,446
Broadwater	Townsend	2,641	3,491
Carbon	Red Lodge	7,533	13,962
Cascade	Great Falls	25,777	28,833
Chouteau	Fort Benton	10,966	17,191
Custer	Miles City	7,891	14,123
Dawson	Glendive	2,443	12,725
Deer Lodge	Anaconda	17,393	12,988
Fergus	Lewistown	6,937	17,385
Flathead	Kalispell	9,375	18,785
Gallatin	Bozeman	9,553	14,079
Granite	Philipsburg	4,328	2,942
Jefferson	Boulder	5,330	5,601
Lewis and Clark	Helena	19,171	21,853
Lincoln	Libby (2)	*	3,638
Madison	Virginia City	7,695	7,229
Meagher	White Sulphur Springs	2,526	4,190
Missoula	Missoula	13,964	23,595
Musselshell (3)	Roundup	*	*
Park	Livingston	7,341	10,781
Powell	Deer Lodge	*	5,904
Ravalli	Hamilton	7,822	11,666
Rosebud	Forsyth	*	7,985
Sanders	Thompson	*	3,713
Silver Bow	Butte	47,635	56,843
Sweet Grass	Big Timber	3,086	4,029
Teton	Chouteau	5,080	9,546
Valley	Glasgow	4,355	13,630
Yellowstone	Billings	6,212	22,944
Totals		243,329	376,053

*Organized since 1900. (2-3) Organized in 1911.

Assessed Valuations.

Wealth has grown even faster than population. The total assessed valuation of all property was $153,401,591 in 1900; $209,912,340 in 1905; $248,774,792 in 1908; $280,401,064 in 1909; $309,673,699 in 1910; and $331,670,318 in 191. The assessed valuation increased in 1911 over 1910, 7.10 per cent, and 33.31 from 1908 to 1911.

VALUE OF ALL PROPERTY IN 1910 AND 1911.

County—	1910.	1911.	County—	1910.	1911.
Beaverhead	$7,595,324	$8,604,073	Madison	$6,965,359	$6,431,426
Broadwater	3,205,616	3,382,621	Meagher	7,108,566	8,367,364
Carbon	7,191,148	7,422,213	Missoula	16,799,987	17,470,449
Cascade	21,246,820	24,171,895	Musselshell	———	9,054,570
Chouteau	15,736,639	17,826,407	Park	8,861,320	9,015,237
Custer	17,557,709	18,254,261	Powell	5,671,990	6,066,999
Dawson	7,965,189	9,927,246	Ravalli	5,532,111	6,094,102
Deer Lodge	8,707,003	8,813,472	Rosebud	9,987,091	10,990,110
Flathead	9,845,105	10,539,277	Sanders	4,406,895	4,816,308
Fergus	16,887,276	14,677,720	Sweet Grass	5,604,834	5,759,818
Gallatin	13,686,579	14,275,649	Silver Bow	36,880,475	36,705,161
Granite	3,174,597	3,269,533	Teton	8,324,483	9,800,136
Jefferson	5,886,153	5,934,079	Valley	8,583,424	9,849,933
Lewis and Clark	20,908,650	20,931,129	Yellowstone	20,187,465	17,976,666
Lincoln	5,165,801	5,242,564	Total	309,673,699	331,670,418

ASSESSED VALUATION OF ALL CLASSES OF PROPERTY AFTER EQUALIZATION BY THE STATE AND COUNTY BOARDS OF EQUALIZATION FOR THE YEAR 1911.

COUNTIES.	Acres of Land	Real Estate and Improvements, Telegraph and Telephone Lines, Railroads, Depots, Round-houses, and Station Grounds	Live Stock	Personal Property Other than Live Stock	Railroads Except Railroad Lands, Grades, Beds, Depots and Station Grounds, Round-houses	Grand Total
Beaverhead	463,696	3,836,999	2,057,818	937,577	1,772,279	8,604,073
Broadwater	251,419	1,343,319	511,415	409,423	1,118,464	3,382,621
Carbon	274,341	3,889,999	1,050,507	1,216,888	1,364,819	7,422,213
Cascade	1,087,780	14,515,724	1,619,644	5,147,688	2,888,839	24,171,895
Chouteau	703,592	6,453,189	3,198,996	2,563,430	5,610,792	17,826,407
Custer	1,980,454	8,942,526	4,142,542	1,774,636	3,394,567	18,254,261
Dawson	1,544,104	5,040,294	2,461,691	1,120,029	1,305,232	9,927,246
Deer Lodge	148,001	5,583,257	170,616	2,139,575	320,024	8,813,472
Flathead	746,567	5,882,575	430,852	1,819,488	2,406,362	10,539,277
Fergus	1,222,097	8,815,492	2,224,961	2,286,667	1,350,600	14,677,720
Gallatin	714,402	9,202,700	847,975	1,806,995	2,417,979	14,275,649
Granite	214,519	1,262,132	355,611	381,872	1,223,918	3,269,533
Jefferson	239,067	1,832,773	354,921	1,079,947	2,636,438	5,934,079
Lewis and Clark	627,792	12,590,495	1,035,610	5,374,805	1,930,219	20,931,129
Lincoln	506,257	2,379,469	71,050	319,080	2,477,965	5,242,564
Madison	506,542	3,274,802	1,127,600	1,272,960	756,064	6,431,426
Meagher	895,710	4,511,283	976,335	866,754	2,012,992	8,367,364
Missoula	827,441	8,673,322	380,592	3,256,405	5,160,130	17,470,449
Musselshell	865,169	5,473,356	930,210	851,183	1,799,821	9,054,570
Park	596,978	5,203,456	885,440	1,516,215	1,410,126	9,015,237
Powell	665,737	2,753,659	733,412	699,995	1,879,933	6,066,999
Ravalli	373,000	4,117,747	445,097	1,020,889	510,369	6,094,102
Rosebud	1,178,488	3,988,784	2,508,439	618,650	3,474,237	10,990,110
Sanders	381,818	1,709,963	131,922	252,028	2,622,385	4,816,308
Sweet Grass	679,874	2,739,691	1,254,236	700,269	1,065,622	5,759,818
Silver Bow	108,163	20,001,105	293,295	14,007,285	2,393,476	36,705,161
Teton	496,839	3,845,076	1,486,506	1,183,457	3,285,097	9,800,136
Valley	179,744	2,233,283	1,811,014	1,404,976	4,400,660	9,849,933
Yellowstone	688,280	10,521,699	1,171,554	2,803,696	3,479,717	17,976,666
Total	19,167,871	$170,623,169	$35,135,271	$58,932,852	$66,975,126	$331,670,418

Resources of Banks.

In 1900 the number of national banks in Montana was 21, the deposits were $13,360,000 and the total assets $19,755,000. In 1910 the number of national banks was 54, the deposits $31,563,000 and the total assets $46,179,000. The increase was 157 per cent in number, 136 per cent in deposits, and 134 per cent in total assets. Strong private banks have existed from pioneer days and state banks in growing numbers for many years. State banks and (since 1911) private banks are inspected by the state bank examiner. State bank and trust companies numbered 51 in 1908 with a total of resources of $25,202,366.48, and on September 1, 1911 the total resources of 110 state banks and trust companies and 40 private banks were $45,418,052.88. As the resources of the private banks in 1908 are not known a comparison of the growth of banking resources cannot be made but the figures indicate a great gain. Between November 27, 1908 and November 19, 1910 the gain in resources of state banks and trust companies was $6,864,716.69. The total resources of state bank and trust companies September 1910, were $31,794,147.24 and $34,436,537.07 on September 1,

1911, an increase of 8 per cent. The total resources of state banks and trust companies and of private banks were $45,418,052.88 which, when added to the total resources of national banks in 1910, makes the resources of all banking institutions in Montana $91,597,000. March 7, 1911, the bank deposits amounted to the very high average of $140 per capita of the population.

AGGREGATE RESOURCES AND LIABILITIES OF 110 STATE BANKS AND TRUST COMPANIES AND 40 PRIVATE BANKS OF MONTANA, SEPTEMBER 1, 1911, AND COMPARISON WITH REPORTS OF 51 STATE BANKS AND TRUST COMPANIES, NOVEMBER 27, 1908.

Resources.	Nov. 27, 1908.	Sept. 1, 1911.
Loans and Discounts	$14,536,023.15	$27,409,448.10
Overdrafts	1,424,805.66	1,116,067.09
Stocks, Bonds, Securities	2,007,643.55	2,769,195.10
Real Estate, Furniture, Fixtures	791,862.24	2,463,224.66
Due from Banks and Bankers	4,123,644.67	7,934,170.61
Cash on Hand	2,173,465.00	3,295,023.77
Checks and other Cash Items	113,385.48	176,846.70
All other Resources	31,536.68	254,076.85
Total Resources	$25,202,366.43	$45,418,052.88

Liabilities.	Nov. 27, 1908.	Sept. 1, 1911.
Capital Stock	$3,125,000.00	$6,988,987.32
Surplus Fund	773,700 00	1,427,327.04
Undivided Profits	964,202.97	1,283,884.99
Deposits Subject to Check	11,783,081.29	24,358,824.75
Savings Deposits	6,602,130.85	8,097,387.96
Due to Banks and Bankers	1,422,733.82	1,784,542.13
Bills Payable		1,334,170.46
All other Liabilities	531,517.50	142,928.23
Total Liabilities	$25,202,366.43	$45,418,052.88

ABSTRACT OF REPORTS MADE TO THE COMPTROLLER OF THE CURRENCY, SHOWING THE CONDITION OF THE NATIONAL BANKS IN MONTANA AT THE CLOSE OF BUSINESS NOV. 27, 1908 AND MARCH 7, 1911.

Resources.	Nov. 27, 1908. Number of Banks—42.	Mar. 7, 1911 Number of Banks—58.
Loans and Discounts	$21,930,514.82	$26,029,904.26
Overdrafts	581,741.93	319,077.57
U. S. Bonds	3,466,200.00	3,786,700.00
Premium on U. S. Bonds	36,679.38	10,697.82
Bonds, Securities, Etc.	1,701,737.91	1,624,213.45
Real Estate, Furniture Etc.	951,551.55	1,304,966.86
Due From Banks	9,920,650.55	7,938,428.70
Checks and Cash Items	193,182.36	177,155.09
Cash on hand	3,071,271.49	3,597,437.14
Redemption Fund	115,680.00	141,135.00
Due from U. S. Treasurer	5,468.00	4,054.35
Total Resources	$41,954,677.99	$44,933,170.24

Liabilities.	Nov. 27, 1908. Number of Banks—42.	Mar. 7, 1911. Number of Banks—58.
Capital Stock	$3,790,000.00	$4,875,000.00
Surplus	1,706,800.00	2,654,518.26
Undivided Profits	1,461,906.29	1,231,936.14
National Bank Notes Outstanding	2,201,207.50	2,750,917.50
Due to Banks	2,004,215.92	2,256,575.82
Individual Deposits	29,393,831.03	29,656,755.04
U. S. Deposits	734,621.91	459,724.57
Deposits of U. S. Disbursing Officers	247,068.28	282,043.13
Bonds Borrowed	211,000.00	25,000.00
Bills payable	198,193.06	730,751.60
Other Liabilities	5,839,00	9,948.18
Total Liabilities	$41,954,677.99	$44,933,170.24

The State of Montana is practically free from debt, owns a splendid capitol, university, college, school, and reformatory, buildings, experiment farms, and fish hatcheries; and owns in trust for the support of the public schools and the higher institutions of learning, many million acres of valuable land. The financial condition of the state is shown by the table on another page.

Montana, with only a small part of its resources developed, produces in one year $364.50 for each inhabitant, the highest per capita production of any state. The items are shown in the following table:

MONTANA'S WEALTH PRODUCTION IN ONE YEAR.

Product.	Quantity	Value.	Product.	Quantity	Value.
Hay	1,244,000 (1)	$16,172,000	Eggs	.....	$ 400,000
Wheat	16,919,000 (2)	15,227,100	Wool	59,820,000 (4)	6,771,000
Oats	19,090,000 (2)	9,450,000	Sheep	569,375	2,337,500
Barley	1,934,000 (2)	1,450,000	Cattle	243,662	10,864,790
Flaxseed	420,000 (2)	1,008,000	Horses	30,097	2,106,790
Rye	80,000 (2)	54,000	Lumber	308 582,000 (5)	4,592,052
Corn	184,000 (2)	175,000	Clay Products	.....	451,389
Potatoes	3,000,000 (2)	2,550,000	Stone	.....	227,507
Sugar Beets	.....	1,000,000	Sapphires	.....	44,500
Other Vegetables	.....	450,000	Coal	2,970,246 (1)	5,940,492
Apples	615,000 (3)	675,000	Gold	146,703 (6)	3,465,364
Small Fruits	.....	350,000	Silver	12,378,714	6,892,216
Grass Seed	17,872 (2)	96,210	Copper	284,808,553 (4)	35,846,412
Beans and Peas	24,718 (2)	46,328	Lead	4,106,292 (4)	176,570
Flour	.....	4,100,000	Zinc	31,638,184 (4)	1,712,569
Dairy Products	2,126,370 (4)	708,790			
Poultry	966,690	628,436	Total	.....	$130,105,015

(1)—Tons. (2)—Bushels. (3(—Boxes. (4)—Pounds. (5)—Feet. (6)—Ounces.

The Ravalli Republican puts the facts in a few words:

Montana is the richest state in the Union. This distinction has been taken from California. The per capita wealth of the Golden State is $2,600 and the per capita wealth of Montana is $3,071, according to deductions made from government figures. Montanans are more than twice as well off as the average citizens of the United States. A statement sent out by the government shows that between 1900 and 1904 Montana increased from $613,879,157 to $746,311,213, or a fraction of a little more than 21 per cent. The past six years have been the most prosperous in the history of Montana. The state gained more in six years than in the previous ten years and yet the resources of Montana are scarcely more than scraped over.

	Balance on Hand Dec. 1, 1908.....	Received 1909 ...	Received 1910 ...	Total.....	Paid out 1909....	Paid out 1910 ..	Balance on Hand Nov. 30, 1910...	Total.....
General Fund	$92,456.90	$1,188,615.82	$1,316,711.46	$2,597,784.18	$1,203,086.86	$1,355,115.96	$ 39,581.36	$2,597,784.18
State Bounty Fund	17,067.47	36,596.26	37,880.78	91,544.51	44,824.60	28,342.25	18,377.66	91,544.51
Stock Inspector and Detective Fund	13,648.05	22,759.42	26,481.23	62,888.70	25,010.54	28,133.50	9,744.66	62,888.70
Stock Indemnity Fund	3,189.12	5,014.60	10,254.40	18,458.12	4,575.18	12,454.79	1,428.15	18,458.12
Sheep inspection and Indemnity Fund	6,460.34	10,556.67	10,448.10	27,465.11	3,763.51	7,531.94	11,169.66	27,465.11
Fish and Game Fund	52,083.27	43,007.07	70,029.97	165,120.31	44,486.71	47,830.65	72,802.95	165,120.31
Escheated Estates Fund	14,109.55	111.40	765.17	14,986.12	.....	.....	14,986.12	14,986.12
University Library Fund	1,755.00	1,360.00	1,511.97	4,626.97	1,755.00	1,360.00	1,511.97	4,626.97
Soldiers' Home, United States Aid Fund	9,014.01	8,596.88	8,953.12	26,564.01	12,674.49	7,058.95	6,830.57	26,564.01
Forest Reserve Fund	.....	61,941.46	78,172.37	140,113.83	61,941.46	78,172.37	.....	140,113.83
Carey Land Act Board Fund	.....	13,844.80	4,806.70	18,651.50	11,451.80	4,970.15	2,229.55	18,651.50
State Medical Board Fund	1,427.18	1,950.00	2,200.00	5,577.18	1,207.07	2,285.29	2,084.82	5,577.18
State Law Library Fund	503.07	514.58	1,027.83	2,045.48	810.52	597.70	637.26	2,045.48
State Examiner's Fund	.....	10,188.00	13,274.17	23,462.17	10,188.00	13,274.17	.....	23,462.17
State Bond Fund	.....	387,520.37	69,414.99	456,935.36	383,936.95	68,049.00	4,958.41	456,935.36
State Depository Interest Fund	.....	11,697.60	19,854.43	31,552.03	11,697.60	19,854.43	.....	31,552.03
State Engineer's Expense Fund	.....	7,637.00	.....	7,637.00	2,431.85	3,715.60	1,489.55	7,637.00
State Land Office Expense Fund	.....	2,404.10	5,750.40	8,154.50	5.00	13.00	8,136.50	8,154.50
Agricultural College Permanent Fund	42,405.63	102,012.62	18,307.94	162,726.19	130,735.70	140.00	31,800.49	162,726.19
Agricultural College Permanent Fund—(Morrill Act)	.....	8,419.72	24,420.00	32,839.72	.....	3,265.50	29,574.22	32,839.72
Agricultural College Interest and Income Fund.	3,500.30	16,097.73	22,942.61	42,540.64	12,633.05	26,112.36	3,795.23	42,540.64
Agricultural College, United States Aid Fund.	.....	40,000.00	45,000.00	85,000.00	40,000.00	45,000.00	.....	85,000.00
Capitol Building Interest and Sinking Fund	71,974.29	72,244.87	73,738.22	217,957.38	122,034.78	70,267.55	25,655.05	217,957.38
Capitol Building Bond Fund, Second Issue	.....	100,000.00	202,744.25	302,744.25	74,657.59	213,759.44	14,327.22	302,744.25
Common School Permanent Fund	46,575.22	281,075.15	400,825.96	728,476.33	196,266.30	415,584.15	116,625.88	728,476.33
Common School Interest and Income Fund	46,329.97	535,686.74	594,272.54	1,176,289.25	557,999.47	517,408.69	100,881.09	1,176,289.25
Deaf and Dumb Asylum Permanent Fund	40,097.70	9,349.05	38,068.80	87,425.55	45,000.00	40,350.00	2,075.55	87,425.55
Deaf and Dumb Asylum Int. and Income Fund	5,828.83	6,173.25	9,429.96	21,432.04	11,205.89	7,182.37	3,043.78	21,432.04
Normal School Permanent Fund	41,977.00	43,779.08	21,303.71	106,159.79	76,200.00	5,000.00	24,959.79	106,159.79
Normal School Interest and Income Fund	7,126.67	18,226.78	22,077.14	47,360.59	10,662.63	32,913.77	3,784.19	47,360.59
Reform School Permanent Fund	9,189.91	20,282.70	1,203.70	30,676.31	28,500.00	30.50	2,145.81	30,676.31
Reform School Interest and Income Fund	8,263.94	5,430.09	6,546.99	20,241.02	8,895.59	10,092.77	1,252.66	20,241.02
School of Mines Permanent Fund	20,840.11	42,182.63	61,199.21	124,221.95	55,000.00	65,455.00	3,766.95	124,221.95
School of Mines Interest and Income Fund	2,606.09	13,856.99	17,459.67	33,922.75	11,275.60	20,690.31	1,956.84	33,922.75
University Permanent Fund	4,693.95	14,658.71	35,092.69	54,445.35	700.00	50,492.00	3,253.35	54,445.35
University Interest and Income Fund	1,983.15	12,025.49	12,380.67	26,389.31	12,788.54	10,596.41	3,004.36	26,389.31
Carey Land Filing Fund	.....	.....	283.00	283.00	.....	.....	283.00	283.00
Casn Balance	$564,116.72	$3,155,817.63	$3,284,764.15	$7,004,698.50	$3,223,452.28	$3,213,091.57	$568,154.65	$7,004,698.50

THE NEW MONTANA.

The three great industries of Montana are mining, stockraising, and farming. The first is firmly established as a great and permanent industry; the second, changing to meet the conditions caused by the passing of much of the free range, will grow greater year by year; the third, the farming industry, has only made a beginning, but the era of agricultural development in Montana has begun and will continue until all the farm lands are in cultivation. When all the arable acres are producing the annual value of crops will equal the wealth produced in any one of the richest agricultural states, and the wealth produced in the mines and on the range will swell the total to an enormous figure.

Montana Agricultural College.

Until recently very little effort has been made to make known Montana's advantages as an agricultural region. Settlers that came in did so without being urged and many were induced to move into Montana because friends and relatives had prospered there. The greatness of Montana as a mining and stockgrowing state caused its agricultural wealth to be overlooked; and many homeseekers passed through it, heard nothing of its advantages, and settled east and west and north on less productive soil. As older states have filled up the pressure of population seeking homes has become great, and the fact is becoming realized that Montana ocntains the only large area of fertile land in the United States that is waiting to be peopled. A strong tide of immigration has set in from the east and from the west, and many Americans are returning from north of the international boundary line. The vacant lands are filling up, and when these are occupied the era of cheap, fertile, lands will be ended in the United States. Montana is growing rapidly in population and in wealth. The new settlers are prospering and additional territory is being made avail-

able for others by the construction of railroads. The advantages the state offers are becoming widely known through letters from farmers who tell of their successes and through literature that is distributed by railroads, by many commercial clubs, and by the State of Montana.

The State of Montana invites settlers and has added to the duties of the Bureau of Agriculture, Labor and Industry those of a department of publicity. Inquiries are sought from all who are looking for new homes. Where can they find better opportunities than in Montana where millions of acres of fertile, virgin, lands beckon to the farmer to come and make his home and fortune upon them? Where else does farming pay so well? A comparison of the average yield of a quarter section in Montana with a like quantity of land in other states, based on the crop reports for 1909, produced the following results:

STATE.	Wheat.	Oats.	Barley.	Flaxseed.	Potatoes.
Minnesota	$2,579.20	$1,848.00	$1,744.40	$2,400.00	$6,440.00
North Dakota	2,192.00	1,689.60	1,444.80	2,336.00	7,920.00
South Dakota	2,256.00	1,632.00	1,403.20	2,270.40	8,064.00
United States	2,539.20	1,963.20	2,145.60	2,294.40	9,310.40
Montana	4,259.20	3,446.40	3,830.40	3,072.00	14,688.00

One Year After Settlement on a Homestead in Rosebud County.

Industrious and intelligent farmers are what Montana needs to bring about the development of its agricultural resources, and for them it offers abundant rewards, as the crop statistics show. Settlers that will make good citizens are wanted; and no invitation is extended to the undesirable, the penniless, the weakling, or the drone; it seeks new citizens but is unwilling to sacrifice quality for quantity. Former Governor Hanly of Indiana expressed his opinion of Montana people in the following words:

"I have been most favorably impressed by my visit, not only with the country

and its latent possibilities in the way of farming, stockgrowing and horticulture, but especially with the character of the people. They are an enterprising lot and their efforts will soon be crowned with a measure of success beyond their hopes and aspirations."

Montana wants the homebuilder, the farmer that has means enough to buy a producing farm or to convert raw lands into one, equipping it and maintaining himself until after the first crop is sold. In many instances a sum sufficient to pay for a well improved farm has been realized from the sale of the first two crops.

As population increases the social conditions of the farmer improves. In some districts electric railway lines have already been built. Rural free delivery routes are numerous, telephone lines are a common convenience in many country districts, and in some neighborhoods dwellings are supplied with electric light and power. Such is the energy of the people that a district will develop in one year more than a community in an older state will develop in ten years; and many farm owners will follow the example of Lewis Penwell, president of the Montana State Fair Association, who has equipped his farm house with electric lights and runs the cream separator, the churn, the washing machine, the iron, the wood saw, and chops hay and grinds grain for stock feed, by electric power.

The man who owns a farm in Montana and has the true spirit of homebuilding enjoys an enviable lot. He dwells in a country where the ozone and the sunshine and the sense of roominess make mere living a joy. He sees his land growing constantly in value and his home becoming more attractive every year. The certainty of a steady income from the farm for the years that are to come is his; and he has, by his own efforts, won the right to hold himself erect before the world for he enjoys the fortune than which none can be greater, "the glorious privilege of being independent."

"We Sure Like Montana," says a new arrival in Dawson County.

TRIUMPHANT MONTANA.

The Record Price for Steers—The Record Yield of Butter Fat—The Record Yield of Wheat—The Best Wheat, Oats, Barley and Alfalfa.

Montana led in 1911 in the production of copper and wool; bank clearances increased, and travelers report a condition of prosperity surpassing that of other states. Millions of bushels of Montana grain have been marketed in Minneapolis. A dispatch from Chicago, dated November 21, stated that F. M. Heinrich of Lodge Grass, Montana, was paid $7.90 a hundred pounds for 20 head of cattle that had never had other food than the grass of the open range, a price never before attained. A record price for a range steer was paid to I. N. Meeks of Wibaux, Montana, when he sold in Chicago a grade Shorthorn that weighed 1,880 pounds for $8.25 a hundred or $155.10 for one steer. Robert Jones of Beaverhead county who exhibited cattle at the Fat Stock Show held in Portland says:

We took hay-fed cattle from our ranch in the Big Hole basin and exhibited them at the Fat Stock Show in Portland this year in competition with grain-fed cattle from eleven sections of the northwest. We drove them sixty miles to the railroad at Anaconda, shipped them to Portland, and they went into the exhibition pens for competition just about as they would into the slaughter pens if shipped for market. And in the competition these hay-fed cattle dressed within two-tenths of one per cent of the highest mark of the grain-fed show cattle.

Polander, a Montana cow, made the record yield of butter-fat, and King Brook, a Madison county trotting horse, established a new Pacific Coast record for three heats. At the Montana State Fair was exhibited a lamb aged four months that weighed 143 pounds.

At the Dry Farming Congress held at Colorado Springs the gold medal for the best potatoes was awarded to H. E. Murphy, of Wibaux, Dawson county, and to John Forster of Grey Cliff, Sweet Grass county was awarded the gold medal for the best hulled barley and the gold medal for the best hulless barley.

MONTANA AT THE NEW YORK LAND SHOW.

Director Linfield of the Montana Experiment Station states in the letter that appears on another page the facts in relation to a yield of wheat in Montana in 1911 that is a world's record. Crops of high average are the rule and many remarkable yields are reported, one being a yield of 28.45 bushels of flax seed to the acre on the farm of James H. McNaney near Savage, Dawson county. The superior quality of the products of Montana farms was established by the exhibits at the Great New York Land Show held in Madison Square Garden in November, 1911. The numerous and splendid exhibits were carefully judged; and when the coveted prizes for wheat, oats, barley, and alfalfa were awarded to Montana exhibitors many who read of this triumph heard for the first time that

ALI

a new agricultural star had arisen in the West. The awards, which gratified but did not surprise the citizens of the state, were as follows:

The Best Wheat in the United States.

The $1,000 silver cup, donated by James J. Hill of the Great Northern Railway "for the best one hundred pounds of wheat grown in the United States in 1911" was awarded to James Todd of Geyser, Cascade county, Montana. Mr. Todd's exhibit consisted of one hundred pounds of Turkey Red winter wheat that was grown without irrigation. It was part of a yield of 75 bushels grown on an acre and weighed 65 pounds to the bushel.

The Best Oats in the United States.

The $1,000 silver cup donated by A. J. Earling, president of the Chicago, Milwaukee and St. Paul Railway, for "the best one hundred pounds of oats raised in the United States in 1911" was awarded to Hartman and Patton of Bozeman, Gallatin county, Montana. The oats entered by T. Menard of the same county were found to be the next best.

The Best Barley in the United States.

The $1,500 silver cup donated by Colonel Gustav Pabst of Milwaukee for "the best bushel of barley grown in the United States in 1911" was awarded to R. Eisinga of Manhattan, Gallatin county, Montana. Colonel Pabst will also purchase all the crop of the prize winner at a fancy price.

The Best Alfalfa in the United States.

The $1,000 silver cup, donated by Paul L. Van Cleve to be awarded "to the person demonstrating the best and widest uses of alfalfa as food for man and beast, who shall also exhibit at this exposition alfalfa meal or flour and bread and other products made therefrom" was awarded to Dr. W. X. Sudduth, of Broadview, Yellowstone county, Montana.

MONTANA AT THE ST. PAUL LAND SHOW.

At the Land Products Show, held at St. Paul, Minn., December 12 to 23, 1911, under the auspices of the Northwestern Development League, there were exhibited the best collection of land products from the states of Minnesota, North Dakota, South Dakota, Montana, Idaho, Oregon and Washington that were ever assembled together. Competition for most of the prizes was limited to states and districts and for some to two states; but the great prizes of the show, "for best state exhibit" and for "best bushel of winter wheat grown in the American Northwest" were open to all states. The following prizes were awarded to exhibits from Montana:

The Largest and Best Exhibit.

The elegant cup offered by L. W. Hill for "the largest and best exhibit of products from any one state," to the State of Montana. This exhibit was collected, entered, and exhibited by J. H. Hall, Commissioner of the Bureau of Agriculture, Labor, Industry and Publicity, who received the cup as the representative of the State of Montana.

The Best Winter Wheat.

The beautiful cup offered by the O'Donnell Shoe Company for "the best bushel of winter wheat produced in the American Northwest" was awarded

to Frank Smart of Bozeman, the wheat being a part of the Gallatin County exhibit.

The Best Barley.

The cup offered by the St. Paul Association of Commerce for the best sample of barley grown in North Dakota or Montana was awarded to John Klaver of Manhattan, Montana.

The Most Beautiful Booth.

The cup offered by W. A. Campbell for the "most beautiful, elaborate and attractive booth at the show" was won by the Judith Basin exhibit

The Best Individual Potato Display.

The J. J. Hill cup for the best individual display of potatoes was awarded to Pat Carney, of Waterloo, Madison county.

Other Prizes.

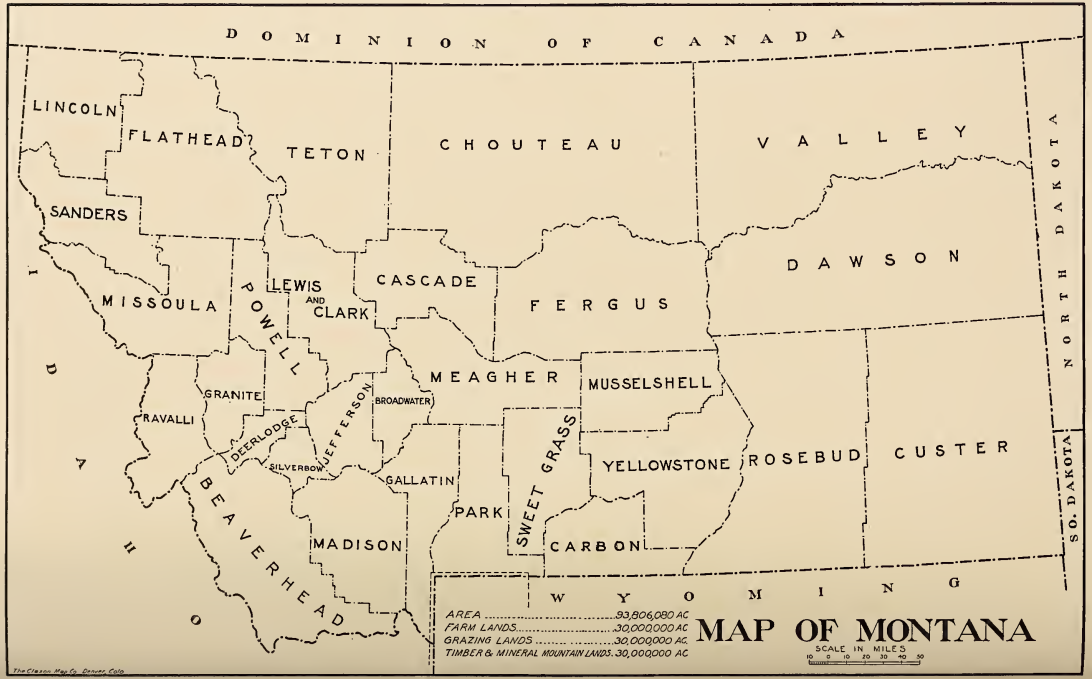
Cups offered by the St. Paul Association of Commerce were awarded as follows:

For the best bushel of non-irrigated wheat grown in Montana, to John Biering, Bozeman; for the best half bushel of irrigated wheat grown in Montana, to R. Eisinga, Manhattan; for the best half bushel of oats grown in Gallatin county, to Peter Ellingsen of Belgrade.

Cups given by Charles W. Clark were awarded as follows:

For the best bushel of potatoes grown in Montana, to H. H. Green, Lindsay, Dawson county; for the best five boxes of apples exhibited from Yellowstone valley, to C. I. Gardner, Billings; for the best half bushel of wheat grown in the Gallatin valley, to Chester S. Williams, Bozeman; for the best half bushel of wheat grown in the Judith Basin, to C. W. Wentworth, Lewistown; for the best grains and grasses, Helena district to the Spokane ranch; for the best collection of garden vegetables in the Musselshell section, to J. B. Kelley, Harlowton; for the best five boxes of apples grown in the Bitter Root valley and displayed in the Missoula exhibit, to the Curlew Orchards, Victor; for the best box of apples grown in the Bitter Root valley, Arnold Clifton, of Victor; for the best five boxes of apples grown in the Flathead district and displayed in the Kalispell exhibit, to Fred. Whiteside, Kalispell; for the "best exhibit from Montana judged for number and quality of samples, arrangement and comprehensive character," to Judith Basin.

The cup offered by the Great Northern Railroad for "the best exhibit by an individual, commercial club or county in Montana" was awarded to Gallatin county.


DOMINION OF CANADA
LINCOLN
FLATHEAD
TETON
CHOUTEAU
VALLEY
SANDERS
DAWSON
NORTH DAKOTA
IDAHO
MISSOULA
POWELL
LEWIS AND CLARK
CASCADE
FERGUS
MEAGHER
MUSSELSHELL
GRANITE
RAVALLI
DEERLODGE
SILVERBOW
JEFFERSON
BROADWATER
GALLATIN
SWEET GRASS
YELLOWSTONE
ROSEBUD
CUSTER
SO. DAKOTA
BEAVERHEAD
MADISON
PARK
CARBON
WYOMING
AREA ..... 93,806,080 AC
FARM LANDS ..... 30,000,000 AC
GRAZING LANDS ..... 30,000,000 AC.
TIMBER & MINERAL MOUNTAIN LANDS. 30,000,000 AC.
MAP OF MONTANA
SCALE IN MILES
10 0 10 20 30 40 50
The Clason Map Co. Denver, Colo.

THE COUNTIES.

BEAVERHEAD COUNTY.

Beaverhead county, located in the southwestern corner of the state, has an area of 5,000 square miles. It contains the source of the Missouri river, and the average elevation of the land is about 6,000 feet. The rivers are the Beaverhead and the Big Hole, each with many tributaries. Along the streams are valleys from which bench lands and rolling hills extend to high mountains.

The industries are stock-growing, farming, and mining. The discovery of gold at Bannack in 1862 caused a stampede into what is now Montana; other rich diggings were soon found, and the Territory of Montana was created and Bannack made the capital. Large quantities of gold, silver and lead have been mined and many undeveloped mines and mining districts offer attractive opportunities for the investment of capital. Government geologists have recently discovered large deposits of high grade phosphate rock near Melrose and many thousand acres of public land have been withdrawn on that account. This asset of great value cannot be utilized under the present policy of the government.

Farming is of irrigated and non-irrigated lands, mainly the former. The chief farming district is the Beaverhead valley with which are connected the smaller valleys of the Blacktail, the Rattlesnake, the Grashopper and Horse Prairie. Oats and hay are the principal crops, oats yielding from 60 to 100 bushels or more of excellent quality. At the Montana State Fair of 1911 George Edinger of Beaverhead county won the splendid silver cup offered by President Elliott of the Northern Pacific Railway for the best exhibit of oats grown in Montana. Two cuttings of alfalfa are made, much timothy is produced, and the native grasses make excellent hay. Beaverhead valley is a wonderful sight to the traveler at all times, and is of especial interest when the crops are ripening and when large shocks of cut grain stand close together. Farming without irrigation on bench lands is a recent development. Excellent crops have been raised in many instances.

The stock industry is the leading one and includes the raising of sheep, horses and cattle. The cattle industry has two phases, the raising of cattle and the fattening of cattle bought outside the county. The Big Hole Basin is the seat of the cattle feeding industry and every year approximately 30,000 head of beef cattle are fattened on the grasses that grow there abundantly and furnish the best of food. The beef cattle bring top prices at the stock yards and are in especial demand for shipment to Alaska. The Big Hole Basin is one of the most wonderful and prosperous parts of Montana and the hay harvest there is a very interesting and instructive sight. Cen-

GRANITE
DEERLODGE
SILVERBOW
RAVALLI
BITTER ROOT
MOUNTAINS
BEAVERHEAD
MADISON
IDAHO
Bowen
Gibbons
Wisdom
Bryson
Fox
Jackson
Aurora
Dewey
Lyon
Wills Point
Glen Station
Farlin
Apex
Polaris
Bond
Argenta
DILLON
Morrison
Barnack
Barratts
Point Dexter
Grayling
Grant
Armstead
Redrock
Wyno
Grab Tree
Dell
Monida
Lakeview
Red Rock Pt.
Upper Red Rock L.
Lower Red Rock L.
Island Park
Yellowstone Park
Big Hole Mts.
Big Hole R.
Beaverhead R.
Medicine Lodge Creek
Blacktail Deer Creek
Horse Prairie Creek
Red Rock R.
Jefferson River
Sawtooth Mt.
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SCALE IN MILES
10 0 10 20 30 40 50
The Olson Map Co. Denver Colo.

tennial valley, a good stock country, was taken from Madison and put into Beaverhead county in 1911.

A market for all products is near, and the diversified industries add to the prosperity of the people. The annual precipitation is 16.32 inches; the soil is very fertile; and grain, grasses and root crops make abundant yields. Most of the public land desirable for farming has been taken up, but opportunities to purchase good farming lands at reasonable prices are numerous.

The Oregon Short Line crosses the county from north to south, and the Pittsburg and Gilmore railroad that has been built west from Armstead into Idaho is to be extended through Dillon to Whitehall.

Dillon the county seat has a population of 1,865, is a delightful place of residence, and is the principal business point in the county. It has two banks, a good hotel, two weekly newspapers. two wholesale and twelve retail stores, a fine public library, and excellent public schools. There are Baptist, Catholic, Episcopal, Methodist, and Presbyterian, church buildings; and other denominations are also represented. Dillon has electric lights, water works and sewers. It is said that there are openings for a flour and cereal mill, for a wool scouring plant and for smelters. The Montana State Normal College is located at Dillon and trains many young men and women to be efficient teachers. The institution occupies handsoe buildings, has a strong faculty and many teachers, and has built up a splendid reputation for thorough work in its especial field.

Lima is an important railroad town and shipping point. Wisdom is the chief trading point in the Big Hole Basin.

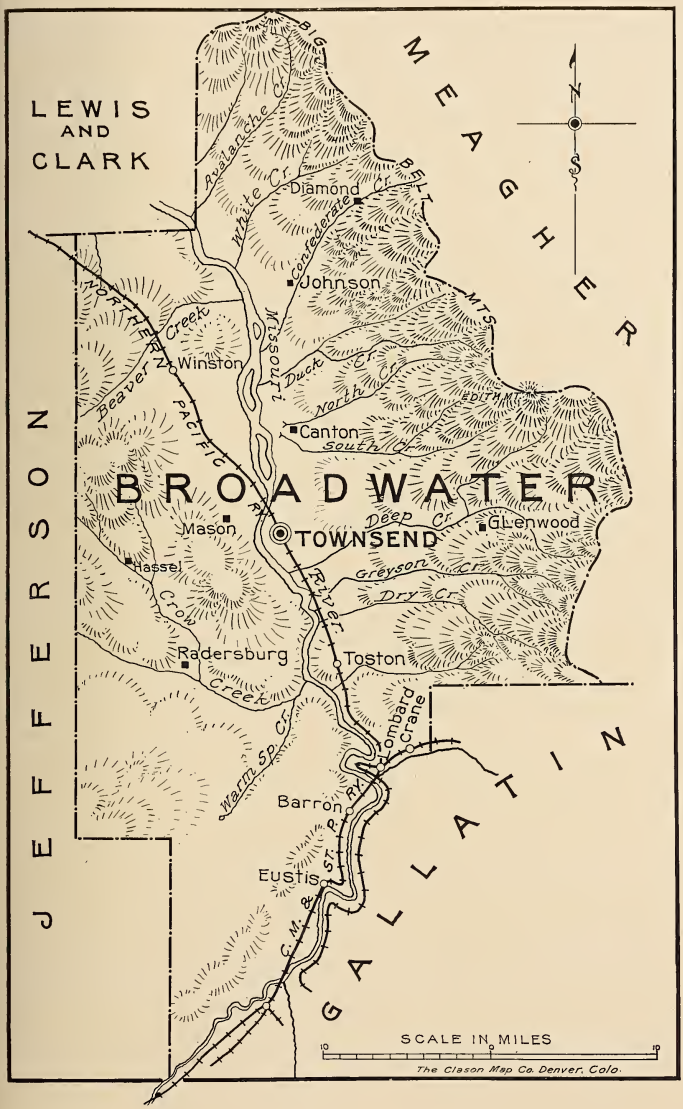
Beaverhead county had a population of 5,615 in 1900 and of 6,446 in 1910; the area was 4,597 square miles before Centennial valley was annexed; the assessed valuation of all property in 1908 was $6,919,702, and $8,604,073 in 1911. This county is in the Helena land district, and on July 1, 1911, there were 286,536 surveyed, and 224,701 unsurveyed, acres of unappropriated public land that are described as mountainous and grazing.

Further information may be had by applying to the secretary of the Beaverhead Commercial Club, Dillon.

BROADWATER COUNTY.

Broadwater county is located on the upper Missouri river and is within close shipping distance of Helena and Butte. The many mining districts furnish local markets for farm products.

The leading industries are mining, stock-growing, and farming. The mineral area is extensive and rich. Placer and quartz mines have produced great sums. The principal mines are at Radersburg and Winston from which many tons of ore are annually shipped to smelters. At Radersburg is great activity, many miners are steadily employed, much development work has been done and new discoveries of ore bodies made. The absence of a railroad limits shipments to ores of high grade; but this handicap may soon be removed, and production is increasing notwithstanding the lack of transportation facilities. Other mining districts offer inviting oppor-


LEWIS AND CLARK
MEAGHER
JEFFERSON
GALLATIN
BROADWATER
TOWNSEND
Diamond
Johnson
Winston
Canton
Mason
Hassel
Radersburg
Toston
Glenwood
Barron
Eustis
Avalanche Cr.
White Cr.
Big Cr.
Confederate Cr.
Belt Mts.
Missouri
Duck Cr.
North Fk.
South Fk.
Beaver Cr.
Pacific R.
Deep Cr.
Greyson Cr.
Dry Cr.
Crow Creek
Missouri River
Warm Sp. Cr.
Lombard
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C. M. & St. P. R.R.
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The Clason Map Co. Denver, Colo.

tunities for the investment of capital in producing mines or in the development of mineral properties.

The claim is made that Broadwater county has the best horses in Montana. Constant care in breeding has been practiced for many years, and fifty registered stallions, from the Shetland of 350 to the Percheron of 2,200 pounds, are owned. Fine herds of beef and dairy cattle are numerous. Since the creamery was built much attention has been given to improving the dairy stock which is now chiefly of blooded Jerseys, Holsteins, and Red Polls.

In 1904 fifty farmers and business men organized and started the Townsend creamery which is the pride of the county. From a small beginning the output increased until it was about 200,000 pounds of butter of a superior quality in 1911. The farmer is paid 29 cents a pound for butter fat at which price a cow of fair grade yields an annual income of $70. Farmers find milk production profitable, and welcome visitors in many homes are the checks from the creamery that come every month in payment. A family that has ten to twenty acres of good land and twenty cows can earn a comfortable living from the sale of milk. The butter finds a market at Helena.

Hog cholera is unknown, the raising of swine is a profitable business, and there are pure bred herds of Poland-China, Chester White, Berkshire, Duroc, and Hampshire hogs. P. J. Meloy of Townsend won at the State Fair in 1911 the blue ribbon for a pen of Poland Chinas and the first prize at the Spokane Interstate Fair.

The range sheep industry has been the source of many fortunes for men who owned from 2,000 to 20,000 sheep. A start has been made in the raising of mutton sheep in small flocks, the nearness of good markets and the abundance of alfalfa and grain for fattening being local advantages.

The principal farming districts are in the Missouri and Crow Creek valleys where many thousand acres are irrigated. The chief crops are oats, wheat, and alfalfa, timothy, and blue-joint, hay. Oats make large yields, are of a superior quality, and have been sold to cereal mills and for seed. Wheat is in demand from millers and many cars of alfalfa and timothy hay are shipped annually. Potatoes yield from 300 to 400 bushels to the acre and other vegetables do equally well.

During the last three years many thousand acres on the foot-hills and benches that extend from Three Forks to the northern end of the county have been settled upon and farmed without irrigation. A large part of the uplands is adapted to dry land farming and good crops have been raised at many places, the rainfall in the spring and early summer being sufficient to produce large yields of all crops that are properly planted and cultivated. The soil, a warm and very productive loam, is easy to work. Winter wheat, rye, bald barley, and alfalfa are the chief crops on non-irrigated farms. Lands of this kind subject to homesteading may still be found, and raw lands may be bought at low prices and turned into productive farms. Large ranches have been subdivided and are offered for sale in farm lots. In 1908

there were 331,126 acres of unappropriated land in Broadwater county and 221,660 acres in 1911.

Fine displays of cattle, horses, sheep, pigs, small grains, corn, grasses, vegetables and f ruits are made at the county fair, and products from Broadwater county have won many prizes at the Montana State Fair. The raising of apples and other fruits on a commercial scale is a new and promising industry. Apples of many varieties have been grown. At the Stafford ranch near Avalanche Creek, is an excellent orchard that has been in bearing for twenty years; and it is said that four thousand dollars was received from the sale of fruit gathered one year from fifteen acres.

The main line of the Northern Pacific follows the Missouri valley from Lombard to Townsend, and the Butte branch is separated by the Jefferson river from the southern boundary. The Mondak-Helena line of the Great Northern will cross a mineral district in the northern part. The Milwaukee, which enters the county near Lombard and passes through the southern end, is expected to build from Three Forks, via Radersburg, in to the Missouri valley.

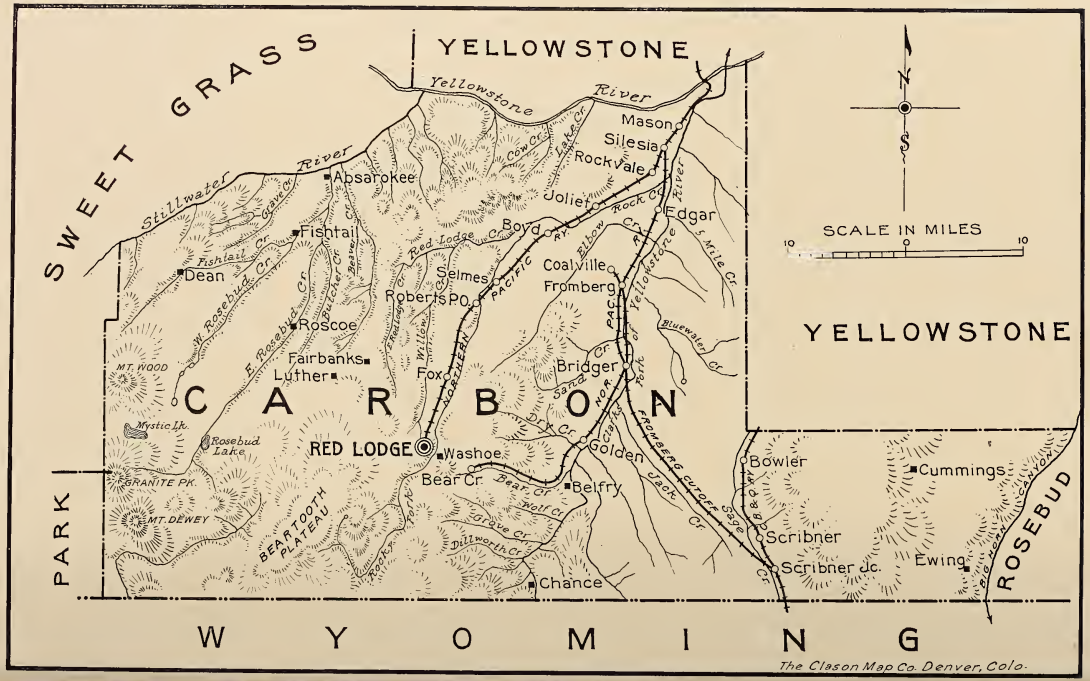
The chief towns are Townsend, Winston, Radersburg and Toston. Toston is the shipping point for the growing mining camp of Radersburg, eleven miles west, and for an extensive country including much of the fertile Crow Creek valley. Winston, 21 miles from Helena, is the supply point for a rich mining district and of a farming and stock region.

Townsend, the county seat and principal town, is located where the Northern Pacific Railroad crosses the Missouri river, is a financial, educational and social center. The city own the electric lighting plant, has a volunteer fire department, five miles of sidewalks, graded streets, excellent schools, Catholic, Episcopal, Methodist and Methodist South churches, good schol buildings, large business houses, good residences, an elevator, a creamery, telegraph, telephone, express and two newspapers. There are good openings for a flour mill, an alfalfa mill, and a beet sugar afctory. The area of Broadwater county is 1,182 square miles; the population in 1900 was 2,641 and 3,491 in 1910, an increase of 32 per cent. The assessed valuation was $1,678,378 in 1908 and $3,382,621 in 1911, an increase of 102 per cent. in three years. Further information may be had by applying to the secretary of the Chamber of Commerce, Townsend.

CARBON COUNTY.

Carbon county adjoins Wyoming, was organized in 1895 and has had a remarkable growth in population and wealth. It is watered by rivers and streams that rise in the Beartooth mountains and afford water for irrigating and for electric power. In the mountains are gold, silver, lead and copper mineral claims, indications of natural gas and petroleum, excellent hunting and fishing, and much remarkably picturesque scenery. The prosperity of the county is assured by the presence of the natural resources that support the industries of coal mining, stock growing, farming, and fruit growing, each of which is helpful to the other.

Immense coal measures exist. and a government report says that in


SWEET GRASS
YELLOWSTONE
Yellowstone River
Stillwater River
Absarokee
Fishtail
Dean
Roscoe
Fairbanks
Luther
Fox
Roberts P.O.
Selmes
Red Lodge
Willow Cr.
Rock Cr.
Lake Cr.
Cow Cr.
Mason
Silesia
Rock Vale
Joliet
Edgar
Boyd
Coalville
Fromberg
Bridger
Sand Cr.
Bluewater Cr.
Elbow Cr.
Yellowstone R.
Mile Cr.
Pacific
Northern Pacific
Chicago, Burlington & Quincy
W. Rosebud Cr.
E. Rosebud Cr.
Fishtail Cr.
Beaver Cr.
Butler Cr.
Mt. Wood
Mystic Lk.
Rosebud Lake
Granite Pk.
Mt. Dewey
Beartooth Plateau
Rock Cr.
CARBON
RED LODGE
Washoe
Bear Cr.
Belfry
Dry Cr.
Golden Gate Cr.
Golden Gate Canyon
Jack Cr.
Wolf Cr.
Silver Cr.
Dillworth Cr.
Chance
Bowler
Cummings
Scribner
Scribner Jc.
Ewing
Old Coal Road
Old Yellowstone Trail
PARK
ROSEBUD
WYOMING
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YELLOWSTONE
The Clason Map Co. Denver, Colo.

200

1907 there were 1,238,976,784 tons of unmined coal in the Red Lodge field. Forty-five feet is the total thickness of the veins and the coal they contain if put together would form a block one mile square and one-fifth of a mile high. In 1909 1,098,476 tons were mined and 1,197,430 tons in 1910. Over 1,000 men are employed in the mines at Red Lodge, 250 at Bear Creek, 200 at Washoe, 150 at Coalville and Bridger and a few at each of numerous smaller mines. The demands of these men make a home market for farm products.

Extensive areas are devoted to grazing and many cattle and sheep are raised. Farms and orchards produce annually about $1,500,000. From hay farmers receive nearly $1,000,000, from oats and wheat about $600,000, and from sugar beets $250,000. Irrigation is practiced in the valleys and dry land farming has been successful on the benches, the yield of oats often being from 60 to 90 bushels, of wheat 30 to 40 bushels, and of barley 40 to 45 bushels. The capacity of the streams for irrigating purposes has not been reached and great power for generating electricity remains unused.

Clarks Fork valley, fifty miles long and from four to ten miles wide, is the principal agricultural district, is one of the most productive parts of the state, produces a great variety of field and orchard products, including cantaloupes of the Rocky Ford flavor, and fruit of high grade and excellent keeping quality. Near Fromberg is the noted Clark orchard of 32 acres which in 1908 produced $10,000 worth of apples, plums, and crab-apples.

The Rock Creek valley contains many productive farms. Mr. E. Grewell, who lives near Joliet, has given an account of the cost of, and the returns from, his crop of 90 acres of wheat, 30 acres of oats, 30 acres of sugar beets and 50 acresofhay. From the 200 acre farm the total returns were $7,689.80, the expenses were $2,620 and the net receipts $5,069.80, or $25.34 net per acre. Upon the Stillwater and the two Rosebud rivers are lands of equal productiveness. The western part of the county needs a railroad to transport farm and orchard products, and power for an electric line may be secured at low cost at the head of the streams.

At Red Lodge and Joliet are elevators and at Bridger, Red Lodge and Fishtail creameries. Joliet has a flour mill.

Joliet on Rock Creek is a trading point for a rich agricultural district, Belfry, Bear Creek and Bridger are thriving towns in coal mining districts. Fromberg, the chief town in Clarks Fork Valley, has a large trade with farmers, orchardists, and coal miners. Fishtail, on the East Rosebud, and Absarokee are the principal trading points in the very productive region through which flows the Stillwater river and its tributaries.

Carbon county is lavishly endowed and offers many opportunities for the homeseeker. Lands vary in price according to location and character but all—whether hay lands, grain lands, sugar beet lands or fruit lands—are selling at prices below their investment value.

Red Lodge, the county seat, is the chief town. It had a population in 1910 of 4,860, having more than doubled in a decade; owns a fine system of water works, has sewers and fifteen miles of cement side walks, is an excellent town for business, and commercial failures are almost unknown.

The monthly payroll of $100,000 from the coal mines would alone make a rich town, but to this sum must be added receipts from other kinds of employment and from trade with the fertile agricultural section that surrounds the city. All the conveniences of a progressive western town are here including a daily newspaper.

Carbon county had a population of 7,533 in 1900 and of 13,962 in 1910, an increase of nearly 100 per cent. The assessed valuations in 1908 were $5,314,703 and $7,422,213 in 1911, an increase of $2,107,510 or 40 per cent. The area is 2,411 square miles and on July 1, 1911 there were 472,736 and 322,838 unappropriated acres of public lands in the Billings and Bozeman land districts respectively.

Further information may be had by applying to the secretaries of the Commercial Clubs at Red Lodge and Fromberg.

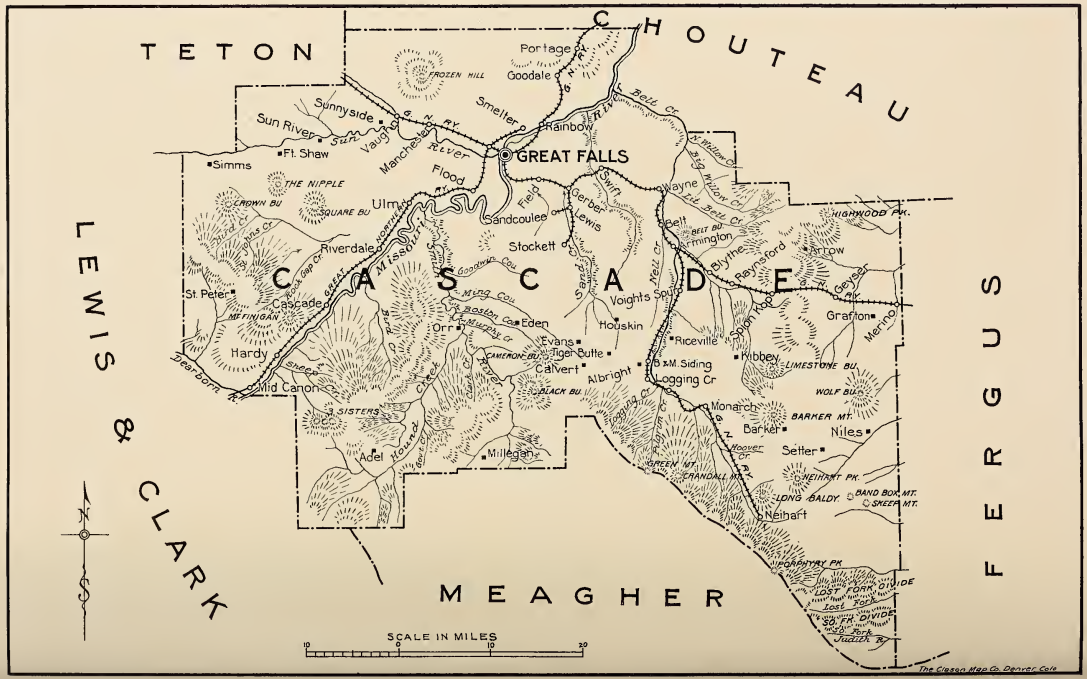
CASCADE COUNTY.

Cascade county, is situated in the northern central part of the state. The southern part includes a part of the Little and Big Belt ranges and the Highwood mountains extend across the eastern border. The Missouri river crosses the county from southwest to northeast and is joined near Great Falls by the Sun river that rises in Teton county and drains a large section east of the Rocky mountains and by Smith and Belt rivers from the south. These streams have extensive valleys.

Cascade county is in the chinook belt; and warm winds from the Pacific Ocean moderate the winter temperature. The occasional cold spells are rarely of long duration and are attended by the dry, calm, atmosphere that makes the cold in Montana felt less at zero than at twenty above in humid countries. Stock run on pasture during the whole year, and are fed only a short time during the winter. The precipitation at Great Falls in 1909 was 23.17 inches, 21.89 in 1908, 22.27 in 1906, and is greater near the mountains.

Farming, mining, and stock growing are the chief industries. Rough and high grounds afford excellent pasturage for live stock. The soil is fertile and the land as a rule lies well for farming operations. In the Missouri, Sun, and Belt river valleys are extensive irrigated areas. Near Cascade is Chestnut valley, a long settled and thriving farming district. One township in this neighborhood has produced 100,000 bushels of grain and much hay. The Sun river valley contains a government reclamation project and many farms that were irrigated before it was begun. The Belt valley is a large and productive section.

Far from railroads are some tracts open to homesteading, but the best opportunity is to buy lands which are for sale at prices below their investment value or to acquire a farm unit in the Sun river project.. The bulk of the farm products are raised on non-irrigated land. Large crops are grown without either irrigation or cultivation by the dry land system of farming. In the northern and eastern sections dry land farming is very successful; and the yields at the experiment station near Great Falls, which are printed on another page, prove what large crops are raised without irrigation.


TETON
CHOUTEAU
LEWIS & CLARK
FERGUS
MEAGHER
CASCADE
GREAT FALLS
Portage
Goodale
Sunnyside
Sun River
Ft. Shaw
Simms
Rainbow
Smelter
Belt Cr.
Manchester
Vaughn
Flood
Ulm
Landcoulee
Gerber
Twin
Field
Lewis
Stockett
Wayne
Belt
Armington
Reynaford
Arrow
Geyser
Highwood Pk.
Riverdale
Missouri R.
Sun R.
Goodrich Cou.
Sand Coulee Cr.
Voights Spr.
St. Peter
Cascade
Meagher
Hardy
Orr
Eden
Houskin
Evans
Riceville
Ribbey
Grafton
Merino
Limestone Bu.
Tiger Butte
Calvert
Albright
S.M. Siding
Logging Cr.
Wolf Bu.
Barker Mt.
Monarch
Barker
Niles
Setter
Hoover Cr.
Green Mt.
Randall Mt.
Cheirhart Pk.
Long Baldy
Sand Box Mt.
Skeep Mt.
Neihart
Highwood Pk.
Lost Fork Divide
Lost Fork
So. Fk. Divide
So. Fork
Judith R.
Wild Canon
Sheep
Adel
Millegan
Scale in Miles
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The Gleason Map Co. Denver, Colo.

The prize cup for the best wheat grown in the United States was awarded at the New York Land Show of 1911 to John Todd, a Cascade county farmer, for wheat grown on unirrigated land near Geyser. First prizes for the best wheat and for the best navy beans were won by Gus Siegeling of Armington at the Omaha Exposition of 1909; and for grains and grasses farmers from this county won 69 prizes at the Louisiana Purchase Exposition.

Common yields are from 20 to 60 bushels of wheat, 40 to 100 bushels of oats, 20 to 60 bushels of barley and of other crops in similar proportion on unirrigated farms. More uniform and usually greater are the yields on irrigated lands. Hay of timothy and alfalfa is a large crop and sugar beets have been grown as an experiment. Vegetables make surprising yields. Apples and other fruits do well. S. C. Beatty of Portage raised 70 bushels of wheat to the acre this year and Mr. Sweeney of Wayne 64 bushels. On his homestead Frank Walnum raised 16 bushels of flax to the acre on 32 acres. Many farmers have found dairying profitable and over $40,000 have been invested in creameries at Great Falls, Cascade and Belt.

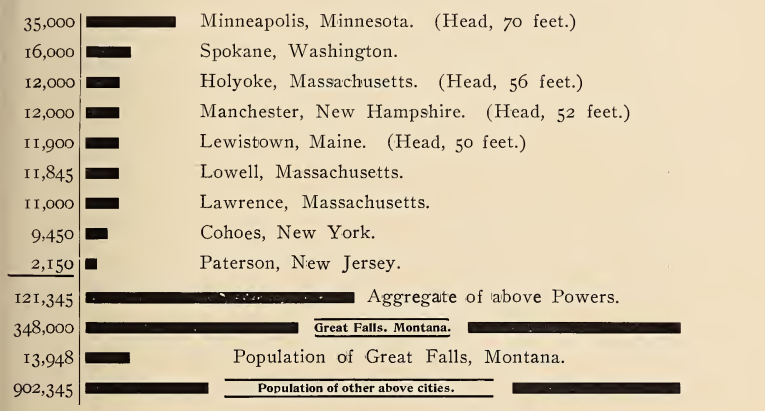
The county has great mineral wealth. In the Belt mountains are quantities of iron ore. Pure limestone abounds, and Neihart and Barker are centers of rich silver, gold, and copper districts. At Armington is mined the gypsum that is manufactured at Great Falls. Excellent building stone has been taken from several quarries. Coal, however is the chief mineral. The beds are very extensive, and mines at Stockett, Belt and Sand Coulee give employment to 1,090 men. The production of the Cottonwood Coal Company at Stockett often exceed 2,000 tons a day. The Cascade coal mines turned out 996,571 tons in 1909 and 929,595 tons in 1910.

This rich territory is served by the Montana Central division of the Great Northern Railroad which extends from Butte to Havre, by the Billings and Northern division over which Burlington trains run, by the Shelby division that connects with the main line at Shelby and extends to the boundary where it joins the Canadian line, by the Stockett branch that hauls coal from the mines at Stockett and Sand Coulee, and by the branch that runs by way of Belt to Neihart. This company is now building a line from Vaughn up the Sun river to Augusta. Surveys have been made by the Milwaukee road north from Lewistown in the direction of Great Falls, and it is rumored that a road will be built down Smith river valley from White Sulphur Springs to Great Falls.

The principal cities are Great Falls, Belt, Stockett, and Cascade. Cascade is a tradingf point for a rich farming and stock growing district, has city water, good schools, churches, a flour mill, two elevators, a creamery, a bank, business houses, and a weekly newspaper. Stockett has great coal mines and is surrounded by a good farming country. Belt is in a fertile valley, has a population of nearly 1,500, has electric lights and water works, schools, elevators, hospital, churches, a bank, business houses, a weekly paper, and coal mines that have employed 400 men.

This rich county takes its name from the wonderful asset with which it is endowed. In seven and one half miles the great Missouri river, with

a mean low water flow of 3,500 second feet, drops 535 feet over a series of falls and rapids. At the head of these falls, at a place where the Missouri, Sun and Belt river valleys come together, where there is a down hill haul from all directions, where all railroad lines meet, the logical location for a great city, is Great Falls. The site was chosen for its natural advantages, the city was planned on generous lines, and it is the natural trading point for a great, fertile, and rapidly developing section. Herewith is a comparison with water powers that have made other cities rich and populous:


H. P.
35,000 Minneapolis, Minnesota. (Head, 70 feet.)
16,000 Spokane, Washington.
12,000 Holyoke, Massachusetts. (Head, 56 feet.)
12,000 Manchester, New Hampshire. (Head, 52 feet.)
11,900 Lewistown, Maine. (Head, 50 feet.)
11,845 Lowell, Massachusetts.
11,000 Lawrence, Massachusetts.
9,450 Cohoes, New York.
2,150 Paterson, New Jersey.
121,345 Aggregate of above Powers.
348,000 Great Falls. Montana.
13,948 Population of Great Falls, Montana.
902,345 Population of other above cities.

The Boston and Montana smelter employs a great number of men whose earnings contribute materially to the business of the town. It has the largest smokestack in the world. The Royal Milling Company has a large flouring mill; there are twenty other manufacturing plants, and a mill to use flax fibre is projected.

Great Falls has all the improvements and conveniences of a progressive, growing, western city, and a system of large and beautiful parks that is peculiar to itself. It has a $400,000 hotel, fine public, business, and residence, buildings; street cars, electric lights, sewer, paved streets, parked avenues, a people confident of its future greatness, and two daily newspapers. It is a pleasant place of residence and a prosperous commercial city. The United States Land office for this district and the office of the Collector of Customs for Montana are located here. Openings for manufacturing establishments and for wholesale houses are numerous.

Cascade county has an area of 3,347 square miles; the population was 25,777 in 1900 and 28,832 in 1910; the assessed valuation of all property was $18,144,963 in 1908 and $24,171,895 in 1911; an increase in three years of 33 per cent.

Further information may be had by applying to the secretaries of the Commercial Clubs at Belt, Cascade, and Great Falls.

CHOUTEAU COUNTY.

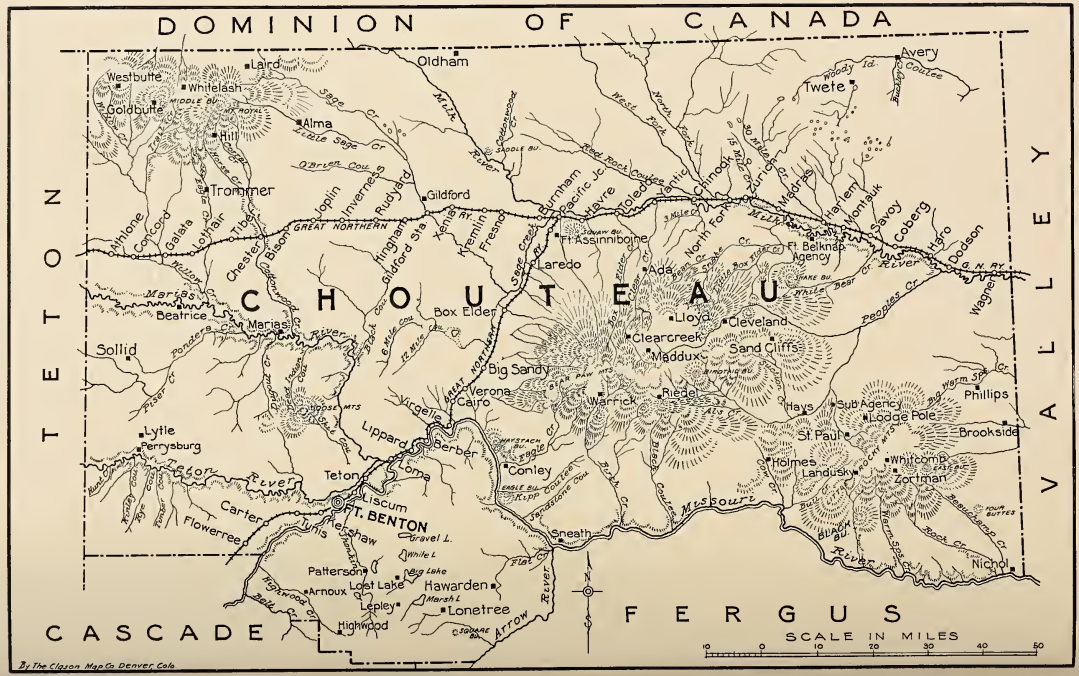
Chouteau is an immense county that lies south of the Canadian boundar and extends 168 miles east and west and 108 north and south. It has an area of 15,439 square miles and in 1910 was inhabited by only 17,191 persons. The county is too large for the convenient administration of the affairs of a rapidly increasing population and proposals to make the northeastern part Blaine county, the western part Hill county, the southern part to remain Chouteau county will probably carry at the special election that has been ordered. The rivers are the Missouri, Teton, Marias, Milk and Arrow. The Missouri crosses the county and for many miles separates it from Fergus county. The Little Rockies and Highwood mountains are in the southern part, the Bear Paw near the center and the Sweet Grass hills in the northwestern corner. The elevations are not high, and the mountainous area is not large. Rough lands border the rivers at places, but perhaps three-fourths of the land consists of prairies, plains and rolling hills.

The average precipitation of northern central Montana is about 17 1-3 inches and in some localities near the mountains it is above 20. "Throughout the year, the distribution" says the government weather report "is especially favorable for agriculture since more than half of the annual amount falls during the four principal growing months, April to July, inclusive."

The annual mean temperature is 40.4 at Chester, 41.9 at Chinook, 44.1 at Fort Benton, 41.9 at Havre and 38.8 at Gold Butte. Chinook winds are more common than in other parts of the state and modify the cold of winter. A comparison of temperatures show that Havre is warmer during the winter than any point along the Great Northern in Minnesota or North Dakota. Records kept at the places named for periods ranging from thirteen to thirty-eight years show the mean temperature for the months of November, December, January, February, and March, according to the table published in the Havre Promoter to be: At Havre, 21.5 degrees; at St. Paul, 21.1; at Duluth, 18.8; at Morehead, 13.7; at Crookston, 13.1; at Pembina, 8.9; and at Sault Ste. Marie, Michigan, 20.6. The mean winter temperature of Havre is practically the same as that of St. Paul, but the climate is more agreeable. There are more days of sunshine; and owing to the lack of humidity in the atmosphere when the temperature is at zero at Havre the cold is less chilling than it is at St. Paul when the thermometer is fifteen degrees above zero.

There is timber in the mountains, but few trees away from them. Coal is relied upon for fuel, crops out at many places, and is mined at Havre, Big Sandy and Chinook. One of the most productive gold districts of Montana is near Zortman in the Little Rockies.

The stock industry is a leading one and the country ranks second in value of livestock. Cattle and sheep in great numbers flourish on the


DOMINION OF CANADA
TETON
VALLEY
CHOUTEAU
CASCADE
FERGUS
Laird
Oldham
Avery
Westbutte
Whitelash
Goldbutte
Alma
Hill
Trommer
Gildford
Twete
Ft Assiniboine
Laredo
Ada
Ft Belknap Agency
Harlem
Montauk
Savoy
Coberg
Hydro
Dodson
Marias
Beatrice
Box Elder
Clearcreek
Lloyd
Cleveland
Sand Cliffs
Madduxe
Solid
Big Sandy
Verona
Cairo
Warrick
Riedel
Hays
Sub Agency
Lodge Pole
Phillips
Brookside
St Paul
Lytle
Perrysburg
Virgelle
Lippard
Berber
Conley
Holmes
Landusky
Whitcomb
Zortman
Teton
Loma
Liscum
FT. BENTON
Sneath
Carter
Flowerreed
Kiel Shaw
Gravel L.
White L.
Big Lake
Pattersons
Arnoux
Loet Lake
Hawarden
Lepley
Marsh L.
Lonetree
Highwood
Arrow
Nichol
SCALE IN MILES
By The Clason Map Co. Denver, Colo.

nutritious native grasses that everywhere abound. Fort Benton, Havre, Chinook and Harlem are the centers of this industry.

The soil for the most part is fertile and produces large yields of wheat, oats, barley, rye, flax, corn, root crops, alfalfa and blue-joint grass.

A remarkable growth in the number and production of farms has taken place in the past three years, before which time farming was chiefly of irrigated tracts. The Milk river valley is very extensive and many acres near Havre, Chinook, Harlem, and Dodson, are irrigated besides smaller areas in other parts. Great crops are grown on irrigated lands, and the irrigated acres will be greatly increased when the Milk river reclamation poject is completed. The great increase in the number of farms and the production of farm products is due to the settlement of bench and prairie lands, back from the valleys, and their cultivation without irrigation. Large crops have been harvested in almost every instance by farmers who have followed the approved methods of cultivation. On another page is a table of crop yields at the Chouteau county experiment station, which is located 25 miles north of Harlem on land that is typical of millions of acres in this section.

The products of the unirrigated farms of Chouteau county displayed at the Montana State Fair of 1911 were wonderful both in quality and variety and received many prizes. Some remarkable yields have been reported for 1911. James Auld brought to Havre from his ranch at Toledo a bunch of alfalfa that measured three and one half feet in height. On his claim at Fresno C. J. Jordan dug 1,600 pounds of potatoes from one hundred pounds of seed; six or seven to the hill was the average but from one hill twenty-seven marketable potatoes were dug. These potatoes were planted on sod land that had been harrowed only once. Some samples weighed over two pounds each and all were smooth and regular in shape.

Charles Sadler of Harlem is said to have raised an average of 50 bushels of wheat and 65 bushels of oats. Irrigated flax yielded 12 bushels and potatoes 250 bushels to the acre. On unirrigated land north of Harlem, flax, the principal crop, yielded 8 to 10 bushels to the acre. E. G. Miller on dry land south of Harlem raised 10,000 cabbages. Great quantities of blue joint hay are shipped from Harlem and Chinook. At the Montana State Fair of 1911 James Griffin of Chinook won the silver cup for the best display of apples of six varieties.

From letters in the possession of the secretary of the Havre Industrial Association the following extracts are taken :

A. D. Shipley: "For the past four years I have scientifically farmed about 40 acres each year, and have had yields of 50 bushels of oats, 25 bushels of wheat, and 20 bushels of rye per acre."

W. D. MacFarlane: "I have grown oats with great success, employing what is known as the Campbell Scientific Farming System, and raised last year on a small tract of bench land, cultivated for the first time, 93 measured bushels per acre."

John Kincella: "I farmed in New York before coming to Montana, and in my opinion, based on many years experience, Montana is much the superior State of the two for farming purposes, because the winters are shorter and less rigorous, and the soil is new, rich, and apparently enexhaustible."

West of Havre is the extensive country north and south of Gildford,

Inverness, Joplin, Hingham, Chester, Galata and Concord that three years ago was a stock range and is now the seat of many thriving, new farming communities.

Flax yields are reported of seven, eight, and nine bushels from Hingham, and Chester. John Fitzpatrick near Alma threshed fourteen bushels to the acre. W. J. Ryner, had one flax stock that had 562 seed balls. A sunflower stalk seven feet high, lettuce measuring twelve inches across the top, immense cabbages and cauliflowers, and radishes as large as beets are other products of the Chester neighborhood. According to the Galata Journal, Rev. Mr. Beebe took seventy pods from one bean stalk and J. W. Blackburn raised a turnip twenty-one inches in circumference. The Hingham Review says Miss Celia Ethen raised a fifteen pound cabbage on her homestead claim, From the Sweet Grass hills come reports of good crops and of great activity in breaking and planting land. Near Box Elder, Carter, Fort Benton, on Arrow Creek, and at other places new settlers have raised profitable crops. On 2,000 acres near Tunis George H. Stevens harvested about 20 bushels of wheat to the acre.

The Great Northern Railroad crosses the county, following the Milk River, and the Montana Central division runs southwest from Havre and affords communication with Great Falls, Helena and Butte.

Fort Benton, an old, rich, and historic town situated at the head of navigation on the Missouri river is the county seat and is the commercial and financial center of an extensive country. It has a daily newspaper, large banks and business houses, and many costly business buildings and residences.

In the Milk river valley are several flourishing young cities. Many thousand fertile acres are tributary to Dodson, which will receive much benefit from the completed unit of the Milk river reclamation project. In a section whose agricultural resources are rapidly developing is Harlem, an enterprising town which is building a water system and expects soon to have sewers and electric lights. It has good business houses and residences, a newspaper, and ships many cars of cattle, sheep, wool, hay and grain. Chinook, an attractive and prosperous little city, is surrounded by productive farm lands, has a coal mine, modern water works, numerous business establishments, churches, hotels, banks, a newspaper, a creamery, an elevator and has openings for an electric light plant and flax mill. Chester the chief town in the western part of the county has grown rapidly from a cattle shipping point to a busy town with a population of about 800. It has recently been incorporated and many public improvements are planned. Chester has hotels, banks, a newspaper, seven stores, an elevator, and is the trading point for the Sweet Grass hills and of a territory embracing more than a million acres of good farming lands.

The most populous city is Havre which is located at the junction of the Montana Central division with the main line of the Great Northern. It is a railroad division point; and the shops, whose monthly pay-roll is about $60,000 are the third largest of the Great Northern Company. Havre has good schools, many churches, large business houses, banks, two news-

papers, the United States land office, a fire department, electric lights and sewer system. It is the trading point of a large and rapidly developing region. Near the town a large coal mine is in operation and an immense bed of cement rock is awaiting development.

The population of Chouteau county in 1900 was 10,996 and 17,191 in 1910, an increase of 56.3 per cent. The assessed valuation of property in 1908 was $12,632,632 and $17,862,407 in 1911 an increase of 41 per cent in three years.

Further information may be had by applying to the secretaries of the Commercial Clubs at Chester, Chinook, Fort Benton, and of the Industrial Associations at Harlem and Havre.

CUSTER COUNTY.

Custer county, in the southeastern corner, has an area of 12,915 square miles and is traversed by the Yellowstone river and its affluents, Tongue and Powder rivers being the chief. The rivers have valleys that vary in width from half a mile to seven miles. Roominess is what the names of such counties as Custer, Dawson, Valley, Chouteau and Teton suggest.

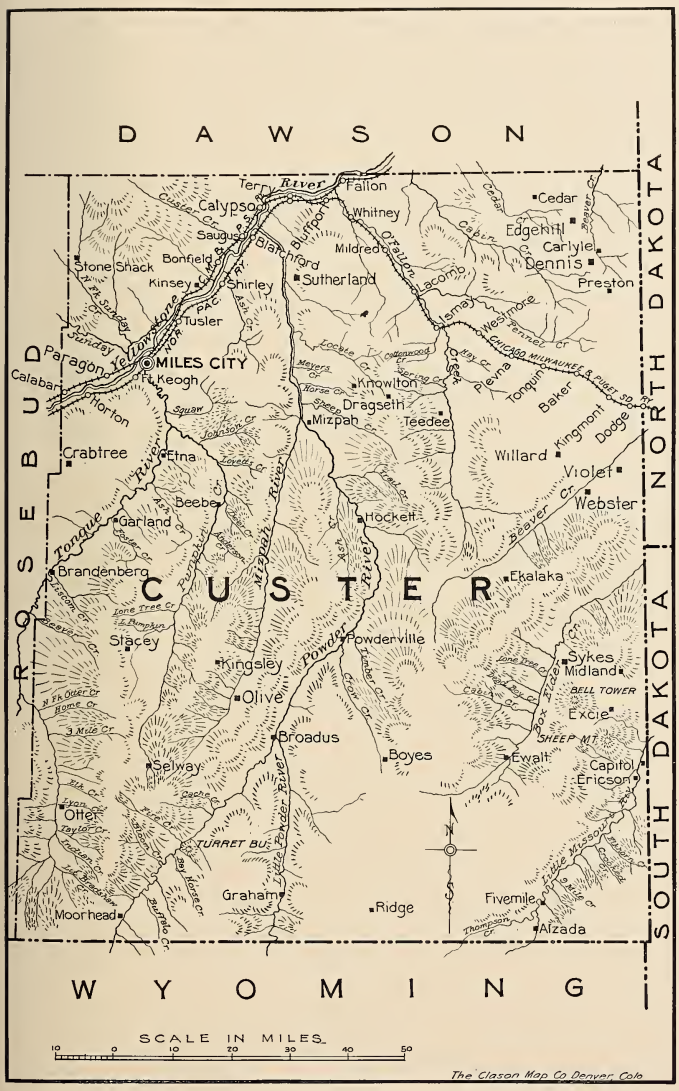
The mean temperature is 44, the same as Wisconsin, the altitude is about 2,300 feet; severe storms are rare; the air is dry, and heat and cold are not felt as in humid regions; in an average year 175 days are clear, 125 partly cloudy, 65 cloudy and 80 rainy. The normal rainfall, about 15 inches, is sufficient for all properly cultivated crops. More than half of it falls during the growing season. Cottonwood and ash grow near streams and pine and cedar in the hills. The county is underlaid with lignite coal which provides cheap fuel.

Custer is the premier stock county of Montana and perhaps no county in the United States has shipped more horses, cattle, and sheep, or more pounds of wool. The greatest primary horsemarket in the northwest is at Miles City where monthly auctions are held during the season. The stockyards embrace 50 acres, and 25,000 strong, hardy, full sized Montana horses are annually sold. At Fort Keogh, an army remount station, many horses are yearly bought for the cavalry.

July 1, 1908 there were 6,151,857 acres of unappropriated public land and 3,975,397 acres July 1, 1911. In three years 2,176,460 acres were taken from the pubic domain in this county, nearly all by homesteaders.

Good water is obtained in wells at depths of from 12 to 25 feet in the valleys and of 25 to 200 feet on the benches. Several large irrigating canals furnish water for about 61,000 acres and others are proposed. Irrigated lands may be bought at low prices compared with what similar land sells for in other states.

Nearly every grain, vegetable and fruit known in the northern part of the United States grows in Custer county. Oats, wheat, barley, rye, corn, cabbages, rutabagas, pumpkins, squash, egg-plant, cauliflower, tomatoes, cucumbers, peppers, radishes, peas, beans, celery, asparagus, make a partial list. Watermelons have a flavor and crispness that are unequalled, cantaloupes grow to perfection, and strawberries are of fine flavor, color


DAWSON
SOUTH DAKOTA
NORTH DAKOTA
ROSEBUD
CUSTER
WYOMING
Terry
Fallon
Calypso
Whitney
Cedar
Edgehill
Carlyle
Dennis
Preston
Saugus
Blatchford
Bluffton
Mildred
Fallon
Lacomb
Bismay
Westmore
Stone
Shack
Bonfield
Kinsey
Shirley
Sutherland
Tusler
Paragon
MILES CITY
Ft. Keogh
Calabar
Horton
Knowlton
Dragseth
Mizpah
Teedee
Plevna
Torquin
Baker
Kingmont
Dodge
Willard
Violet
Webster
Crabtree
Etna
Beebe
Garland
Hockett
Brandenberg
Ekalaka
Stacey
Powderville
Sykes
Midland
Kingsley
Olive
Broadus
Boyes
Ewalt
Capitol
Ericson
Excie
Selway
Otter
Graham
Ridge
Fivemile
Alzada
Moorhead
Torongo
Tongue River
Powder River
Little Powder River
Little Missouri River
Chicago Milwaukee & Puget Sd. R.R.
SCALE IN MILES
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and size. Peaches, pears, apples, crab-apples, gooseberries, currants and raspberries do well. There is a home market for fruit and vegetables and an unsupplied demand for alfalfa, dairy products, eggs and chickens.

Horses, cattle and sheep thrive on alfalfa which is the leading crop, and sells at from $5 to $12 a ton; an acre, cut three times a year, yields from four to five tons. Oats yield from 50 to 100 bushels an acre, barley does well and 50 bushels of club wheat is an average yield.

The transformation of Custer county from a stock to a farming country is proceeding with astonishing rapidity. The railroads follow water grades; and when one enters the Yellowstone valley he does not realize that he is entering one of the most fertile agricultural regions in the world. An observer has aptly written:

"You cannot glimpse the good broad level prairies from a car window; you cannot see many of the best farms from the railroad; but once you get away from the railroad you will find good plow land on every hand, and, naturally, the further away you go, the more plentiful is the unoccupied land. One writer who made the trip across Custer county and wrote a description of it for his eastern friends summed up the whole situation in these words: 'It is simply an expanse of fine soil—new, undeveloped, unpeopled—pregnant with possibilities and awaiting only the creative hand of man to bring forth into reality that state of agricultural opulence which signifies the attainment of the ideal. In one single word it is—opportunity.'"

The yields at the three Custer county experimental farms are printed on another page. Equal or better results have been obtained on the bench lands. The quantity of land recently brought under cultivation is surprising. Between 25,000 to 30,000 acres are in cultivation near Terry it is said, principally in flax, oats, and wheat.

Good crops were harvested near Ismay from about 40,000 acres of grain and 8,000 of flax, and from about 40,000 acres of wheat, oats and flax near Baker. In the southeastern corner, far from railroads, settlers have come in and are doing well. On Ft. Keogh military reservation Capt. H. P. Howard put in 200 acres, using improved methods for cultivation unirrigated land, and obtained good yields. The Miles City Independent says a man near Ekalaka harvested a little over two bushels from two pounds of flaxseed. Around Carlyle fifty traction outfits have been at work, the country is developing rapidly, and "no section of Montana can show such splendid wheat yields," it has been said.

Wayland Wood writes from Knowlton, October 7, 1911 that his experience in farming unirrigated land has been very satisfactory. On summer fallow his Turkey Red wheat yielded thirty bushels to the acre.

F. E. McFarland writes, from Preston, Nov. 6, 1911, to the Commissioner of the Bureau of Agriculture, Labor and Industry:

"I am writing you a few lines in regard to my opinion of this country as a farming country. I think it one of the best in the world for a poor man to get a start; it will have to be an awful poor year that a man cannot make more than enough to pay expenses. I have been here for four years. We have had two what are considered poor years in this country but I am still four thousand dollars ahead of the game. I was born and raised in Greenbrush, Minn. That is a good farming country, but I can make more money in one year here than I can in ten there and not have to work the year round to do it. There is still some land subject to homestead entry near here. Raw land is worth about $25 per acre and improved land about $10

more. There is plenty of fuel to be had for the hauling and the water is good with a few exceptions."

At the State Fair, Custer county had a remarkable display of corn, which is becoming an important crop. All vegetables and root crops grow profusely. The prize pumpkin at the Montana State Fair of 1911 was a Custer county product and weighed over 90 pounds. A display of honey attracted much attention.

In Custer county are many opportunities for the homeseeker to acquire good farming lands under the homestead law or by purchase at a low price. Land is advancing as a result of settlement but is still selling at prices to tempt the investor. The Northern Pacific railroad owns many acres, and some large ranches have been divided into farming tracts and placed on sale. The older settled districts are near railroad lines and agricultural development of the vast back country will quickly follow the construction of new railroads.

The Northern Pacific railway follows the Yellowstone river through the county; the Chicago, Milwaukee & Puget Sound railroad cuts across the northeastern corner to the Yellowstone river, crosses near Terry and follows up the river to the western boundary.

The chief towns are Miles City, Terry, Fallon, Ismay, Baker and Ekalaka. In the southeastern part, fifty miles from the railroad, is Ekalaka, the center of a great stock country and the trading point for a large region. Baker, a new and flourishing town on the Milwaukee railroad, is in the midst of a large prairie country into which many settlers have come, and has good business buildings and residences, a weekly newspaper, and a lake that adds to its attractiveness. Ismay on the same road has made similar growth, and has perhaps more costly buildings. Fallon, in the Yellowstone valley, is a supply point for an established farming district nad for a region of bench lands that is being turned into farms. Terry, the second city in population and business importance located where the line of the Milwaukee crosses the Northern Pacific, has experienced a decided growth since the construction of the former road, has elevators, business houses, banks, a weekly newspaper and is surrounded by a productive agricultural country. An expensive bridge crosses the Yellowstone and affords access to a large region on the north side that contains much good farming lands.

The metropolis for all this great, undeveloped empire is Miles City, the county seat, located at the junction of the Tongue and Yellowstone rivers, an up-to-date, growing, progressive western town of 4,697 people in 1910. There are two daily and three weekly newspapers, a number of manufacturing establishments, many wholesale and retail stores; it is the distributing point for a large and developing territory, and ships more horses, cattle, sheep and wool than any other town of its size in the country. It is a division point on the Chicago, Milwaukee & Puget Sound railroad, whose large monthly pay roll contributes to its prosperity. It is expected that a railroad will be built from Sheridan, Wyoming, to iMles City that will open up a rich country. There are three banks with deposits

of $3,500,000, two clubs, two first class hotels and a number of small ones, four churches, two public schools, a Carnegie library, a Catholic convent school, a grain elevator, and municipal water works and electric light plant. Many opportunities exist for the investment of capital in manufacturing and other enterprises.

The population of Custer county was 7,891 in 1900 and 14,123 in 1910, an increase of 79 per cent. The assessed valuation of property in 1908 was $11,192,110 and $18,254,261 in 1911, an increase in three years of 63 per cent.

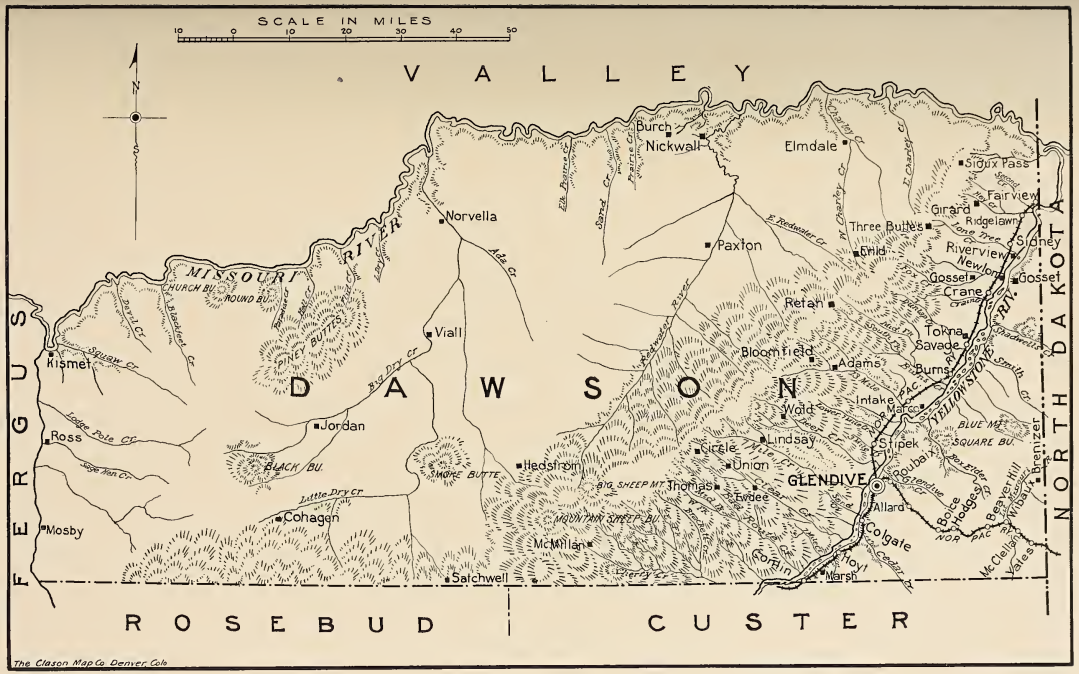
Further information may be had by applying to the secretaries of the Commercial clubs at Baker, Ekalaka, Fallon, Miles City and Terry.

DAWSON COUNTY.

Dawson—"the gateway"—county lies between the Missouri and Yellowstone rivers. Stock growing, the occupation of the first settlers grew to large proportions and is still a leading industry. Agricultural development came later and is progressing rapidly. In the valleys are irrigated lands, including the Lower Yellowstone reclamation project, that makes great yields of all crops and are especially adapted to growing alfalfa and sugar beets.

In 1911 about 350,000 acres were cultivated, 130,000 acres being in flax. The great increase in farms and farm production has been on non-irrigated bench lands and the excellent crops grown indicate the destiny of the great area of virgin lands. The normal rainfall is about 15.42 inches. On the experiment farm 25 miles north of Glendive Turkey Red wheat yielded 36.63 bushels, fall rye 32 bushels, oats 51 bushels and potatoes 147.56 bushels to the acre. The significance of these results is that they prove the fitness for profitable farming without irrigation of millions of acres of prairie and bench lands. This extensive region has been described as a continuation of the Dakota wheat belt, the land being of equal or superior fertility. The high average rainfall, and the fact that rainfall comes during the growing season, give assurance of bountiful crops. The low altitude assures a longer growing season than in sections of Montana where diversified farming has been successfully carried on for years. The greater part of the undeveloped region is prairie and rolling land that is ready for the plow. Many reports from settlers who came with small means and have accumulated competencies have been collected by the Glendive Commercial Club, and numerous new grain elevators bear witness to the transformation the country is undergoing. Another proof of the remarkable growth is that the school teachers numbered 65 in 1910 and 135 in 1911.

At the Fourth International Dry Farming Congress held in 1909, Dawson county was awarded 43 premiums. In the grand sweepstakes open to the world for the best general exhibit of agricultural products Dawson county was first; and it also won four silver loving cups, one for the best collective exhibit from any county in Montana, Idaho, North Dakota, South Dakota, Wyoming, Eastern Oregon, or Eastern Washington, another for best display and largest exhibit of root crops, the third for the best display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Burch
Nickwall
Elmdale
Sioux Pass
Fairview
Girard
Ridgelawn
Three Buttes
Child
Riverview
Newlon
Sidney
Gosset
Crane
Norvella
Paxton
Refan
Viall
Kismet
Church Bu.
Round Bu.
Sidney Buttes
Skyline Cr.
Dry Cr.
Blackfoot Cr.
Big Dry Cr.
Jordan
Ross
Lodge Pole Cr.
Sage Hen Cr.
Black Bu.
Little Dry Cr.
Cohagen
Mosby
Satchwell
Bloomfield
Adams
Intake
Marco
Wold
Lindsay
Circle
Union
Headsmon
More Butte
Big Sheep Mt.
Thomas
Ewdee
Mountain Sheep Bu.
McMillan
GLENDIVE
Allard
Colgate
Sidney
Toona
Savage
Burns
Square Bu.
Blue Mt.
Bennett Hill
Bicentennial
Bruce
Hodges
Wibaux
Breinzer
McCleary
Yates
Hoyt
Marsh
Corlin
Cedar Cr.
Liberty Cr.
Beaver Cr.
Prairie Cr.
Spring Cr.
Alkali Cr.
Redwater River
Little Beaver Cr.
Big Beaver Cr.
Cherry Cr.
Box Elder Cr.
Timber Cr.
Coal Cr.
Smith Cr.
Deadman Cr.
Mile Cr.
Sand Cr.
Wibaux Cr.
Sheep Cr.
Crane Cr.
Locust Cr.
Tree Cr.
Rock Cr.
Bad Route
Square Bu.
Yellowstone River
Missouri River
N. Pac. R.R.
Great Northern R.R.
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and largest variety of corn, the fourth for the best display of oats. Individual exhibitors won first prizes on winter rye, millet, pop corn, sheaf of flint and dent corn, flax, Kaffir corn, timothy, watermelons, citrons, flat turnips, and for the best displays of sun flower heads, broom corn. Dawson county was first for displays of flax in sheaf and one-half bushel, best display of field pumpkins and squashes, broom corn (special), spring wheat, flax and sorghum. At the Dry Farming Congress of 1911, in competition with the world for the best potatoes H. E. Murphy was awarded the first prize, a gold medal. The prize winning potatoes were grown near Wibaux.

The Glendive Monitor reports a crop of 1,500 bushels of flax on 100 acres of unirrigated ground, 35 miles north of Glendive. The Savage Star prints an affidavit from Iver L. Leivestad in which he states that on May 20, 1911, he planted 1.90 acres in barley, irrigated it thoroughly, harvested the crop August 12 and that the yield for the 1.90 acres was 204 bushels.

Dawson county has an area only 330 miles less than the combined area of Massachusetts and Connecticut; it has 8,368,000 acres and is inhabited by only 12,725 persons, of whom one-third live in towns. The population is mainly in the Yellowstone and Beaver valleys; great areas are practically unpeopled.

July 1, 1908, the vacant and unappropriated public lands were 7,495,629 acres, and on July 1, 1911 4,924,273 acres. In three years 2,551,356 acres had been filed on. The vacant p ublic lands at the end of the fiscal year numbered 4,944,273 acres, of which 3,142,561 acres were in the Miles City land district, 1,271,551 acres in the Glasgow district and 530,161 acres in the Lewistown district. Homesteaders have as a rule selected claims as near to the railroads as they could get, and a vast acreage of good land in the central part of the county through which a road is expected to be built in 1912 is now open to homesteading.

Coal is abundant, is dug by farmers on their lands or is hauled from coal banks within a few miles and is sold at a low price in the towns. The two great navigable rivers flow through the county, and a great amount of hydro-electric power could be obtained from them.

The main line of the Northern Pacific Railway enters Dawson county near Wibaux, drops into the Yellowstone valley at Glendive, and follows the river to the western boundary of the county. The principal towns are on this line. Down the Yellowstone from Glendive a branch road is now under construction that will extend as far as Sidney and may ultimtaely be extended to Mandan. The Great Northern Railroad is separated from the northern boundary of the Dawson county by the Missouri river and a narrow strip of land north of it, and settlers who have come into the northenr part of the county ship from Poplar and other points on that line.

Two large railroad enterprises for the development of this great country are believed to have been decided upon. They are the Mondak-Helena line of the Great Northern and the Glndive-Helena cut off of the Northern Pacific. From Glendive the last named railroad, it is reported, will run nearly due east through Dawson county to a point in Fergus or Meagher

counties from which the two companies will use in common a track to Helena. The plan of the Great Northern, it is said, is to build from Mondak, or some other convenient point near the mouth of the Yellowstone, up the valley to Sidney, and thence west through the central part of Dawson county to Lewistown, Fergus county. A very extensive territory will be opened up when these lines are completed which should develop as rapidly as did the Judith Basin after the construction of the Billings and Northern division of the Great Northern.

The principal towns are Glendive and Wibaux. Savage, Sidney, Newlon, and Fairview are new towns on the Lower Yellowstone project. Wibaux, a progressive town that has sprung up near the famous Wibaux cattle ranch six miles from the Dakota line, has a population of about 500, modern department stores, elevators, banks, churches, schools, two newspapers, and is the trading point for the extensive and fertile Beaver Valley. In 1907 the bushels of grain bought in Wibaux were 12,000; 430,000 bushels were shipped in 1910. The increase shows how great has been the development of the farm lands near the town in so short a time.

Glendive, the county seat with a population of 2,428 in 1910, is a busy, growing, town; it is the chief trading point for a very large and rapidly developing territory, and large numbers of cattle and great quantities of wool are shipped every year. Glendive is a division point on the Northern Pacific Railroad and the company has a large monthly pay roll. The new line down the Yellowstone and the Glendive-Helena cut off will add greatly to the importance of the place as a railroad and distributing center. There are handsome public and business buildings, good schools, and many churches. Glendive has an electric light plant, municipal water works, three newspapers, a fair grounds, large hotels, and commercial houses representing every line of trade. The Northern Pacific Railway has a plant for the manufacture of reinforced concrete piers and slabs for bridge work.

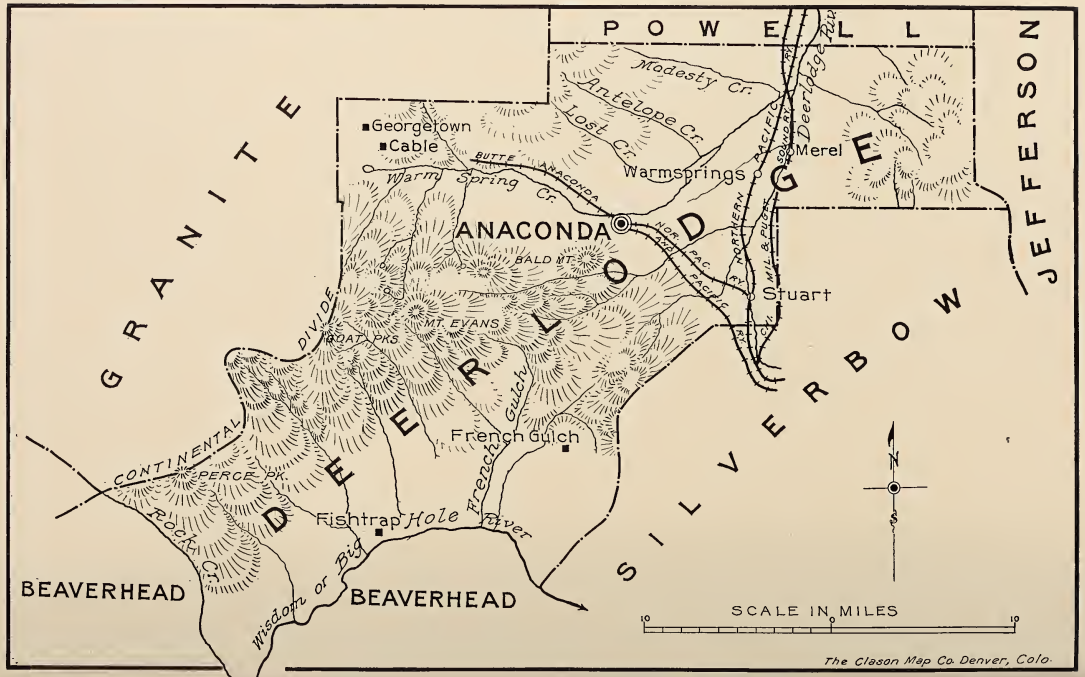
The population of Dawson county in 1900 was 2,443, and 12,725 in 1910, and increase of 421 per cent. Assessed valuation of property in 1908 was $5,887,205 and $9,927,246 in 1911, an increase of 68 per cent. in three years.

Further information may be had by applying to the secretaries of the Commercial Clubs at Glendive, Sidney, and Wibaux, and to the manager of the Dawson County Development League, Glendive.

DEER LODGE COUNTY.

Deer Lodge county, next to the smallest of the counties, having an area of only 726 square miles, yet is one of the richest. It is in Western Montana, is drained by the Deer Lodge river, and embraces part of the valley of that stream. The principal industry is the smelting of copper ores. At Anaconda, the county seat, is located the Washoe Smelter of the Amalgamated Copper Company which was erected at the cost of $7,500,000, employs about 2,000 men, and has a monthly payroll of about $215,000.

This great smelter is the largest and most modern copper reducing plant in the world and smelts about 25 per cent. of the copper produced in the United States. The ores are brought from the mines at Butte, 28


POWELL
GRANITE
JEFFERSON
SILVERBOW
DEERLODGE
BEAVERHEAD
BEAVERHEAD
Georgetown
Cable
Modesty Cr.
Antelope Cr.
Lost Cr.
Warm Spring Cr.
Warmsprings
Merel
ANACONDA
BALD MT.
Stuart
MT. EVANS
DIVIDE
BOAT PKS
CONTINENTAL
PEAK PK.
ROCK Cr.
French Gulch
French Gulch
Fishtrap
Hole
River
Wisdom or Big
BUTTE
ANACONDA
PACIFIC
NORTHERN
NOR. PAC.
MIL. & PUGET
SCALE IN MILES
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miles distant, directly to the smelter by the Butte, Anaconda & Pacific Railroad which was built for the purpose. Even after an inspection of this plant one can scarcely comprehend the immensity of its operations. This is what it takes to feed its great maw every day: Amount of ore treated in 24 hours, 10,000 tons; lime rock from adjacent quarries, 2,300 tons; coke used, 650 tons; coal for reverbatory use, 500 tons; coal for power use, 500 tons ;water, per minute, 35,000 gallons.

Anaconda, the county seat, is a city with 10,134 inhabitants, is a delightful place of residence, has fine residences, business blocks, and public buildings, one daily newspaper, the State Fish Hatchery, and manufactories of fire and building brick.

The mountains contain much picturesque scenery and mines of placer and quartz gold. In a district west of Anaconda near the Granite county line extensive mining operations are being carried on. Definite announcement was made November 26, 1911 of the intention of the Butte, Anaconda & Pacific Railway to extend, without delay, a line from Anaconda into the Georgetown Lake section a distance of 22 miles. Lumbering is an important industry and a large part of the timber used in the mines of Butte is cut in the mountain regions.

Though not great in numbers the live stock includes many valuable animals of the best breeds. Large quantities of hay, wheat, oats and gar- Anaconda, where nearly $2,000,000 are annually paid out to miners and den truck are grown. A market for all products is at hand in Butte and smeltermen.

Mitchell & Mussigbrod at Warm Springs have a ranch of 5,000 acres, a large part of which is under cultivation. They have one of the best Holstein dairy herds in the state and have won prizes at county and state fairs, for cattle, hogs, root crops and all farm products. They raised crops as follows:

CROP—	ACRES.	PRODUCT.
Hay	400	800 tons
Alfalfa, first cutting	60	150 tons
Alfalfa, second cutting	60	90 tons
Oats	30	1,500 bushels
Wheat, (Macaroni)	15	310 bushels
Beets, (Manglewurtzel)	3	60 tons
Beets, (Sugar)	1	10 tons
Carrots	½	10,000 pounds
Cabbage	5	750,000 pounds

In hot beds large quantities of cabbage plants, cucumbers and letuce were raised. Peas, lettuce, onions, kohlrabi, parsley, kale, turnips, cauliflower, table beets, radishes and rutabagas were grown in large quantities.

A wonderful exhibit of grains and grasses, arranged in the most attractive manner, was made by Deer Lodge county at the State Fair of 1911 and was awarded the first prize. A similar exhibit in 1911 was not entered in competition.

The County Commissioners who have letters from many farmers giving accounts of crop yields, have issued a pamphlet in which they say:

"To the homeseeker with, little capital and plenty of energy, Deer Lodge county offers unexcelled if not unequalled opportunities. Ten acres well handled will return a good living and will represent only a fractional part of the investment necessary

to get land enough elsewhere, not so favored in regard to markets, on which to make the same good living. There's still a lot of good land to be had in the valley, and with intelligent tilling it will yield more for the honest effort put forth than the same amount of land anywhere else in Montana. With but from forty to eighty acres of good land one who grows a variety of crops and raises hogs, chickens, a few cattle, etc., can handle his farm on a small investment and with profit. He can gradually increase the number of his cows until he has the number that he can most profitably keep. The number of fowl can also be easily increased or decreased to suit the conditions. Hogs of some good standard breed should be kept. He should be able to turn off a few head of horses each year. An orchard and small fruit should be started at an early date. The product of such a farm will bring high prices on the market. The demand for small fruit, butter and eggs, beef, pork, etc., that is fattened and marketed at the proper time will make fancy prices."

The unappropriated public lands in 1908 were 95,078 acres and 61,911 in 1911.

The Northern Pacific and the Chicago, Milwaukee and Puget Sound railways run through the Deer Lodge valley, and the Butte, Anaconda and Pacific to Butte.

Powell county has been taken from Deer Lodge county since the census of 1900. In 1910 Deer Lodge county had a population of 12,988. The assessed valuation of all property in 1908 was $8,638,563 and $8,813,472 in 1911.

Further information may be had by applying to the secretary of the Chamber of Commerce, Anaconda.

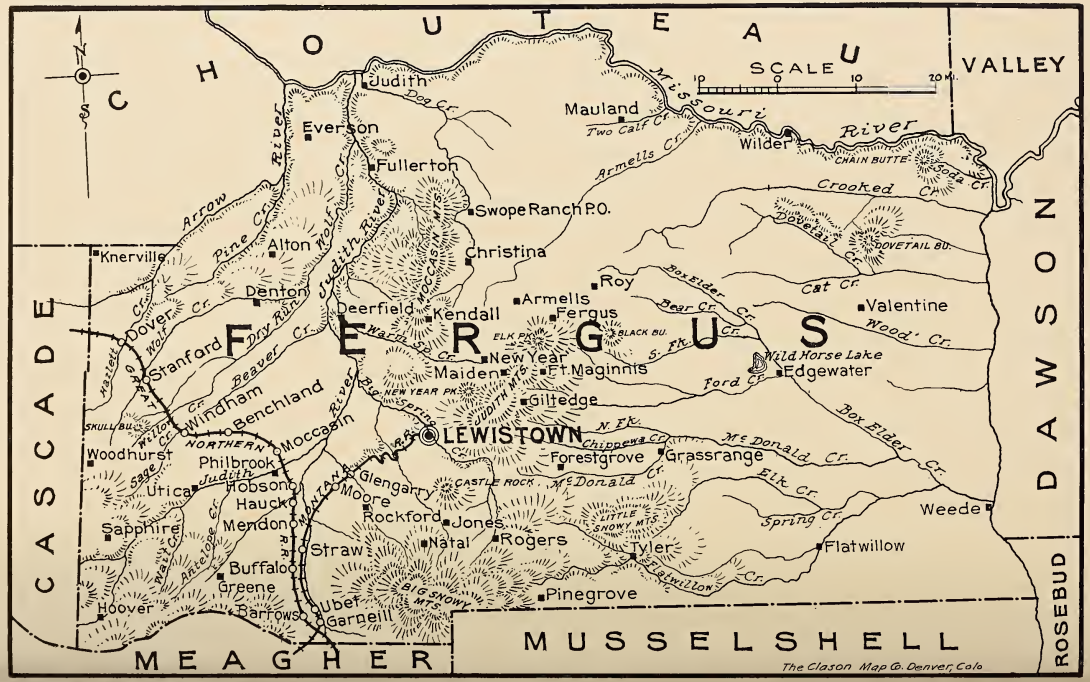
FERGUS COUNTY.

Fergus county is in the center of the state and includes Judith Basin a remarkably fertile district of 1,900,000 acres of rolling prairies that has undergone a wonderful development in the last five years.

Fergus county is an ideal country for stock growing which is an important industry. It is also a rich mineral county having large producing gold mines at Kendall, Maiden and Gilt Edge, undeveloped mineral claims in other sections, at Yogo the greatest sapphire mines in the United States, hundred of thousands of acres of good coal lands, many small and several large coal mines. The mountains and hills contain much timber.

Agriculture, however, has leaped in a few years from an unimportant to a leading industry, a development that was delayed until railroads were constructed. The soil in Judith Basin is a black loam, enriched by limestone, the climate is good at all seasons, the elevation is 3,500 to 4,500 feet; the average rainfall at Lewistown is 22.10 inches, more than one-half of which falls during the growing season, so that all the resources of a great farming region were present except people to till the ground and they have been coming in large numbers. Whole townships that were unoccupied a few years ago are now producing grain. The transformation of a stock into a farming country has been rapidly accomplished and the increase in the quantity of grain raised in 1911 from that grown in 1905 is probably greater than was ever shown in any other country for a similar period.

Alex. B. Lehman estimates that the crops of 1911 amounted to 6,000,000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DOVETAIL BU.
Knerville
Alton
Christina
Roy
Box Elder Cr.
Cat Cr.
Valentine
Denton
Deerfield
Kendall
Armells
Fergus
Bear Cr.
Wood Cr.
FERGUS
Stanford
Dry Run
Warth Cr.
ELK PARK
BLACK BU.
New Year
Maiden
Ft. Maginnis
S. Fk.
Wild Horse Lake
Edgewater
Ford Cr.
Windham
Benchland
NEW YEAR PK.
Gilt Edge
Box Elder
SKULL BU.
LEWISTOWN
N. Fk.
Chippewa Cr.
Ms Donald Cr.
Woodhurst
Philbrook
Moccasin
Forestgrove
Grassrange
Utica
Hobson
Glengarry
CASTLE ROCK
Elk Cr.
Sapphire
Haucke
Moore
Rockford
Jones
Spring Cr.
Weede
Mendon
Straw
Natal
Rogers
Tyler
Flatwillow
Buffalo
Greene
Flatwillow Cr.
Hoover
Barrows
Ubet
Garneill
Pinegrove
MUSSELSHELL
MEAGHER
ROSEBUD
DAWSON
CASCADE
The Clason Map Co. Denver, Colo

bushels of wheat, 500,000 bushels of oats, 162,000 bushels of flaxseed, and 400,000 bushels of potatoes, and that 10,282 freight cars could be filled with the farm products of Fergus county. "With the production of $7,000,000 worth of products from ranch, farm and mine," he says, "there would be sufficient to give every man, woman and child $500 each." The possible future production when all the raw lands shall be in cultivation is amazing. The grain lands are estimated at 1,225,000 acres that should yield 30,000,000 bushels annually, loads for 45,000 cars. Great as has been the development of farming in the county the movement is still in its early stages and opportunities are abundant.

Wheat, oats, barley, flax and hay are the chief crops. Winter wheat is the leading crop though both spring and macaroni wheat are grown to a less extent. Thirty bushels is a medium crop of winter wheat and the weight of a bushel is sometimes as high as 66 pounds. It is of excellent milling quality and some crops grade No. 1 hard. Oats yield from 50 to 90 bushels to the acre, barley about 40 bushels, flax makes large yields, 150 to 600 bushels of potatoes are dug from an acre; blue joint, timothy and alfalfa produce hay in large quantities; vegetables yield well, and fruits thrive.

On earlier pages will be found reports of yields at the Judith Basin Experiment Station, and for 1909 compiled by the Moore Inland Empire.

In 1907 reports from 83 farms in Fergus county showed an average yield of 36.66 bushels of wheat; the average yield of oats on 90 farms was 56.40 bushels; and of barley 43.91 bushels on 17 farms. The average wheat yield of the county for 1911 is put at 30 bushels to the acre. Individual crops as high as 56 bushels are reported.

The production of dairy products, eggs and poultry fails to meet the local demand. Frank Barton sold his butter from 18 cows for $1,280.00 and Mrs. W. F. Hannah received more than $500 from the sale of the products of five cows and four dozen chickens. Gus Peterson drove into Lewistown with a load of timothy seed which he sold for $614.70.

A visitor stated to the Moore Nonpareil that he owned land in the east that was worth $200 an acre, and also owned land in the Judith Basin that cost less than $50 an acre, and that the Montana land produced more per acre than the eastern land. After an auto ride through the grain districts I. I. Boak, head consul of the Woodmen of the World, said to a reporter of the Fergus County Argus:

"You can put in your paper as coming from me that I have been in Colorado, Utah, Idaho, California, Oregon and Washington, but my eyes have never rested upon a sight like this. It is simply marvelous."

While on the way to California to spend the winter, Nelson Ross, a Fergus county farmer, stopped at Butte and said to a reporter of the Anaconda Standard:

"I purchased a relinquishment on a homestead near Moore, nine years ago for one hundred and seventy-five dollars, and the deal involved not only the land, but a house and barn that had been erected by the original locator. I have raised a crop every year during that time and my production of wheat has run from forty to sixty bushels an acre. Four years ago I had a yield of fifty-one bushels to the acre and

refused ninety-three cents for the wheat, yet at the same time I could not have sold that land at that time for twenty dollars an acre."

The opportunity for the landseeker in Fergus county is to purchase farm lands at $30 an acre and up near railroad lines, cheaper land farther back, or to take up a homestead in the unsettled section. Land that may be relied upon to raise year after year thirty or more bushels of high grade wheat or other crops in like proportions before many years will have a fixed value perhaps amounting to double the price at which lands in the Judith Basin may now be bought.

More than thirty grain elevators bear testimony to the quantity of grain that is produced, and there is need for more. More than 250 steam plow and gasoline outfits have been engaged in breaking land, and one grower hauls to the elevator with a traction engine, four wagon loads at a time.

The rise of farming followed the construction of railroads that made it possible to market surplus crops. For many years good crops for local consumption had been grown in the valleys, and about ten years ago practical farmers settled on the bench lands south of Moore and began to raise grain. The extension into the Judith Basin of the Montana Railroad, now a part of the Milwaukee system, was followed by a great development of the farm lands near its line ;and when the Billings and Northern division of the Great Northern was built through Fergus county the change from a stock to a farming country was rapidly accomplished. So great has been the development that new lines are urgently needed to transport grain. A line that was built from Lewistown to Hilger, a distance of eighteen miles, late in 1911, is already hauling large quantities. A road from Moccasin to Lewis may be in operation by spring; and it is expected that before the crops of next year are to be moved the Milwaukee line from the Musselshell valley to Lewistown and thence through the productive region northwest of the latter city will be built. From the east is to come the Mondak-Helena line of the Great Northern. Very promising sections in the eastern and southeastern parts of the county will be opened by these roads.

Lewistown, the metropolis and county seat, when an inland town, eighty miles from a railroad was a very busy and prosperous place and has expanded its activities in all lines as the county has developed. The population returned by the census of 1910 was 2,892 and is said to be 4,000 in 1911. The city has an abundant supply of pure water, boulevard streets, a sewerage system, a fire department and a public library. The business houses are chiefly of stone or brick; there are four elevators, a flour mill, a brick yard, five wholesale mercantile establishments and a number of retail ones. Four banks have deposits of $2,700,000; there are good schools, churches and a hospital; an electric light plant, two telephone systems, one daily and two weekly papers, large machine shops, hotels, theatres and many handsome residences.

Moore, twenty miles south and west of Lewistown, in the center of a rich agricultural district is the second town in importance, had a population in 1910 of 573, has two newspapers, two banks, a number of business houses, three churches, a high school, a $30,000 hotel, three grain ele-

vators with a capacity of 275,000 bushels, and a cement brick block factory and a brick yard.

Straw, Garneill, Hobson, Utica, Windham and Denton are towns in the farming section. At Stanford, which has grown in three years from a small village to a thriving town, is said to be a good opening for a flour mill. Kendall is the chief town in the gold mining districts. Hilger, less than a year old, is the terminus of a branch line from Lewistown. Grass Range and Flatwillow are villages in the southeastern section, into which many settlers have recently come.

The unappropriated public lands were 3,466,469 acres in 1908 and 1,939,203 acres in 1911. In three years 1,527,266 acres were appropriated, mainly by homesteaders.

The creation of Musselshell county in 1911 took from Fergus $3,408,216 of taxable wealth, caused a loss in territory of three townships and two sections that were ceded to Meagher county, and townships 6, 7, 8, 9, 10 and 11, ranges 19 to 31 inclusive that were put in the new county. A considerable population was also lost with the ceded territory. The population in 1900 was 6,937 and 17,385 in 1910, a gain of 10,488 or 150 per cent. The assessed valuations were $10,865,893 in 1908 and $14,677,720 in 1911, a gain of $3,811,827 or 35 per cent notwithstanding the loss of $3,408,216 of property.

Further information may be had by applying to the secretaries of the Commercial Clubs at Lewistown, Moore and Stanford.

FLATHEAD COUNTY.

Flathead county embraces Flathead Lake and valley, Flathead river and its tributaries. The northern part is mountainous, heavily timbered, and includes most of the Glacier Park. About 200,000 productive acres are in the valley proper and much logged over land is being cleared. The soil is very fertile, many springs and streams furnish pure water, wood is abundant, and undeveloped coal fields exist.

The industries are farming, fruit growing and lumbering. Wheat yields from 35 to 50 bushels per acre, oats from 35 to 75 bushels, and barley, rye, hay, potatoes and other vegetables make large yields. The logging camps and lumber mills furnish home markets for farm produce.

On both shores of Flathead Lake are fine farming and fruit growing districts, and south of the lake is the Flathead reservation that was opened in 1910. The climate is excellent and it is never very hot or very cold. Kalispell is 2,965 feet above sea level; the annual precipitation is 15.45 inches, and crops grow without irrigation.

Stock raising, farming, lumbering, was the order of development and some experiments were made at an early date in fruit-growing. "The fondest dreams of the most sanguine have been realized," it is said; and today the Flathead country is one of the best fruit districts in the world. Flathead county fruit has won prizes at many expositions, including the cup offered in 1910 by the Lethbridge, Canada, Chamber of Commerce for

DOMINION OF CANADA
LINCOLN
TETON
LEWIS AND CLARK
SANDERS
MISSOULA
POWELL
FLATHEAD
WHITEFISH
KINTLA PK.
TRAPPER PK.
Reuter
Adair
Radnor
Olney
Geduhn
Snyder
JACKSON MT
TRIPLE DIVIDE PK.
STIMSON PK
Rockhill
Nyack
Garry
Paola
Summit
Essex
Apgar
McDonald Lake
Lupfer
Vista
Coram
Columbia Falls
KALISPELL
Sheldon
Montford
Creston
Batavia
Kila
Somers
Holt
Bigfork
Ashley L.
Pleasant Valley
Lake Blaine Rock L.
McGregor L.
Marion
Athens
Hubbard
Proctor
Dayton
Rollins
Glen
Gildart
Swan L.
FLATHEAD LAKE
SWAN RANGE
MISSION RANGE
FLATHEAD RANGE
PENTAGON MT
SILVER TIP
MAZUMA PK.
Polson
Irvine
Big Fork
Swan River
Flathead River
Middle Fork
Summit
Essex
Yaak
Yaak River
Kootenai River
Fisher River
Tobacco River
Whitefish River
Stillwater River
Ferry Creek
Big Creek
Camas Creek
Coal Creek
Quartz L.
Logging L.
Upper Kintla L.
Kintla L.
Bowman L.
Lake Five
Lake Six
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The Clason Map Co. Denver Colo

McIntosh Red apples, and displays at the land shows of 1911 enhanced the county's reputation for producing fruit of the largest quality.

Many varieties of apples are successfully grown; a mature orchard will yield 500 boxes per acre and a box will sell at from $1.25 to $1.75. Crab apples are raised in abundance and often pay better than the regular apple. Probably the most profitable crop raised is cherries, and especially the large sweet cherry. Leading varieties are the Bing and Royal Ann which have been shipped to New York and sold for 40 cents a pound. They ripen when cherries from other regions are out of market, and because of superior size, color, quality, and freedom from worms, find a ready sale. On the Montana market they bring from 11 to 20 cents per pound. One hundred trees are set to the acre, a mature tree yields an average of 150 pounds, and an acre 15,000 pounds. Sold at an average price of 15 cents a pound the gross income for one acre is $2,250. Pears, plums, peaches, strawberries and raspberries are successfully grown. One grower sold strawberries from less than 1 1-2 acres for $715. An acre of raspberries yielded $900. Fruits mature in any part of the valley, but the lake shoe is a favored spot owing to the equalizing influence on the atmosphere of a large body of water and because the residents have become fruit specialists. Orchards are free from pests and a wormy apple is unknown. The grower will agree to give the buyer his entire c rop if one worm is found therein.

An average of yields and prices for several years in the Flathead valley for well managed farms shows about as follows per acre: Wheat, 40 bushels at 80 cents, $32; oats, 70 bushels, (2,800 pounds), at $1.10 per cwt., $30.80; rye, 35 bushels at 50 cents, $17.50; potatoes, 300 bushels, (16,800 pounds), at $1 per cwt., $168.

The average yield per acre of a good orchard under intelligent management, without irrigation, and with mature trees is as follows:

Apples, 500 boxes at $1.00	$ 500.00
Pears, 500 boxes at $1.25	625.00
Prunes, 720 crates at 75 cents	540.00
Plums, 720 boxes at 75 cents	540.00
Peaches, 600 boxes at 80 cents	480.00
Apricots, 600 boxes at 80 cents	480.00
Crabs, 720 boxes at 85 cents	612.00
Cherries, 19,200 quarts at 8 cents	1,625.00

This estimate on cherries takes into consideration an average of both sweet and sour varieties. The sweet cherries taken alone will show a higher revenue.

For the smaller fruits the figures are: Raspberries, 5,625 quarts at 10 cents, $562.50; Strawberries, 5,000 quarts at 8 cents, $400.00; Currants, 3,750 quarts at 6 cents, $225.00; Gooseberries, 3,125 quarts at 6 cents, $187.50.

From an orchard of 6,000 apple trees State Senator Whiteside, a noted orchardist, gathered this year about 12,000 boxes. The number of fruit trees, according to the census taken in the fall of 1911, was about 300,000; 32,333 on the east and 46,363 on the west side of the lake. The Flathead fruit district is still in an early stage of development and there are many

opportunities to buy orchards or proved fruit land at prices low in comparison with those asked in fruit districts of other states.

Farm production was never so large as this year, a result in part due to the cultivation of lands in the Flathead reservation. Great yields are reported from farms near Polson, from which about 275,000 bushels of grain were shipped. Only a tithe of these fertile lands are yet producing, and the 1912 crop in this territory may reach 1,000,000 bushels. Henry Kermode, a homesteader on the Sunny Slope hill, raised 60 bushels of oats to the acre on new breaking and concedes the championship on old ground to J. B. Jette whose field averaged 110 bushels to the acre. Floyd Fry of Elmo raised 7 tons of potatoes on one acre and James Parsons 4 tons on one-half acre, the largest weighing five and many others three pounds. A turnip weighing over 32 pounds was exhibited at the Kalispell Chamber of Commerce, and from Whitefish come reports of excellent yields of grains, grasses, vegetables, and fruits.

The Dayton Leader says:

There is a small ranch in Dayton Creek valley which grew this year barley six feet high, oats six feet high, wheat five feet six inches high, red clover five feet high, white clover four feet high, strawberries that yielded at the rate of eight hundred dollars per acre, raspberries, blackberries, and all kinds of vegetables in proportion. We challenge Flathead valley, or the whole state of Montana, to equal this record on a single ranch. These extraordinary, crops are still on the ground and can be seen by anybody. The editor of the Leader has seen them and can vouch for the truth of the above statements.

In the northwestern Montana lumber district the standing timber has been estimated at forty billion feet. The pay-roll is $1,251,375 per annum, the lumber sold brings $2,500,000, and 2,070 men are employed. Of the numerous lumber mills in the county the largest is at Somers where also is a tie preserving plant.

Flathead Lake having an area of 360 square miles is the central attraction, and around its wooded shores are some of the most beautiful spots on the continent. Orchards come close to the water, and summer homes are found at many attractive places. Flathead Lake is not merely a wonder and a delight to the visitor but is of great practical use. It is navigable and seven fast passenger boats were in service in 1911. Two years ago one boat was sufficient for the business. Besides steamboats and gasoline launches, tugs, barges, and rafts transport much freight between the lake ports.

The Great Northern is the only railroad, the main line crossing the county. At Columbia Falls a branch line extends to Kalispell fifteen miles distant. From Kalispell one branch extends eleven miles to Somers, the principal port on the north shore, and another in a western direction to Marion, thirty-eight miles. A branch line across the Flathead Reservation to connect Kalispell with the Northern Pacific at or near Dixon was surveyed some years ago. The Milwaukee railroad has surveyed a line down Swan river into the Flathead valley reaching Kalispell and extending north to the Canadian boundary. In the fall of 1911 work was begun on the construction of the Flathead Inter-urban Electric railway that begins

at Kalispell, extends northwesterly toward Whitefish, and passes through the rich farming districts of Stillwater and Spring Creek. The plan is to extend this line southword to Flathead Lake and Big Fork.

The county is rich in water power. Near Polson the great power supplied by the Flathead river is to be used for pumping into irrigation reservoirs as well as to furnish power for ordinary uses.

Kalispell, Whitefish, Polson, Columbia Falls, are the chief towns. Polson, the principal port on the south shore of Flathead Lake, is a shipping point for a large and productive part of the Flathead Reservation that was opened two years ago. It is only two years old, but is a thriving, incorporated city, with a population of about 1,500, has modern improvements, good schools, churches, banks, business houses, electric lights, telephones, a weekly, paper and steamboat service to points on the lake. Big Fork, in a fine fruit district, is the trading point for the Swan river country. On Whitefish lake, a beautiful body of water seven miles long, at the head of Flathead valley is Whitefish that has grown in a few years to be a modern, progressive town of 2,000 people having city water, electric lights, telephones, sewers, brick business blocks, banks, business houses, a weekly newspaper, and a good fruit country adjoining. It is a railroad town, is a division point on the Great Northern and has a monthly payroll of from $100,000 to $150,000 a month. Columbia Falls, at the head of the fertile eastside of the Flathead valley, has a bank, stores, a newspaper, lumber mills, the State Soldiers Home, and is an important trading point for a rich agricultural district. Dayton is a new town on the west shore. Belton is the entrance to the Glacier National Park, a region of wonderful scenery to which thousands of visitors will be yearly attracted.

Kalispell, the county seat and the business center of northwestern Montana, has 200,000 acres of rich agricultural land tributary to it, and ships large quantities of apples, cherries, and small fruits. The United States land office is located here, the county high school, a b usiness college; the city has a water system, a sewer system, electric light and power, telephones, paid fire department, over ten miles of cement side walks and boulevarded and macadamized streets. Five elevators, a cold storage plant, large lumber mill, a flour mill, and has openings for factories to utilize raw products. Kalispell is a very attractive place of residence, has four newspapers, good schools, many churches, fine residences and business blocks. A census of fruit trees shows one for each inhabitant, and one citizen picked 2,155 roses from his garden last summer.

July 1, 1911, the unreserved and unappropriated public land was 134,212 acres, mostly mountainous, and there are few opportunities to secure lands under the homestead law; but the country is still new and farming and fruit lands may be bought at prices that are low considered from an investment point of view. Orchards and orchard tracts are selling at lower prices than in less excellent fruit districts in other states. Many acres of logged over lands may be bought at prices that will yield large profits to those who will clear and make farms or orchards of them.

The population of Flathead county was 9,375 in 1900 and 18,785 in

1910. Though Lincoln county was taken from it in 1909 the increase in decade was 9,310 or 102 per cent. The assessed valuations of property in 1909 was $9,146,852 and $10,539,277 in 1911 an increase of $1,392,425, or more than 15 per cent in two years.

Further information may be had by applying to the secretaries of the Chambers of Commerce at Kalispell, Whitefish and Polson.

GALLATIN COUNTY.

Gallatin, the pioneer county to make farming the main industry and the greatest producer of farm products, includes the Gallatin valley which has been called "The Egypt of America." In this favored region crop failures are unknown. Farming began in 1864 and has grown until about 600,000 acres are in cultivation. The county has room for ten times its present population, a condition due to the large size of the farms, one of 700 or 800 acres being not uncommon while forty acres or less is enough to support a family in comfort. New lands on the edges of the valleys are coming into cultivation every year and the large holdings are being divided and sold in farms of moderate size. The day of the large farm has passed and the era of the little farm well tilled has commenced. Lands are on sale at prices that are low for soil of such marvelous productiveness.

About 300,000 acres are irrigated and produce from 50 to 75 bushels of barley, 80 to 140 bushels of oats, 35 to 80 bushels of wheat per acre. Hardy varieties of apples, plums and cherries do well; strawberries yield $700 to $1,200 an acre; radishes, lettuce, onions, peas, carrots, parsnips, beets, turnips, cabbage, beans, sweet corn, tomatoes, pumpkins, squashes, turnips, asparagus and celery are raised. Potatoes of the best quality are grown, the yield being from 300 to 500 bushels per acre. Red and alsike clover are extensively grown as well as timothy and alfalfa. Yields of 3 to 5 tons an acre are usual. These crops and field peas fit in with a system of crop rotation, following grain, and have in part a local market as feed for dairy stock and hogs. Dairying, poultry raising and raising hogs are profitable branches of farming.

The lands in the valley are usually irrigated; those on the foothills are farmed without irrigation, and have for years been producing excellent crops. The unirrigated land under cultivation approximates 300,000 acres.

The average production of grain per acre is believed to be unequalled in any county in the United States. Reports collected from 192 irrigated grain fields embracing 14,000 acres gave an average crop of 58.2 bushels per acre and of $38.28 as the average returns per acre. The average yield of oats was 76.4 bushels, barley 58.7, wheat 44.2 and potatoes 291.5 bushels.

From 76 non-irrigated grain fields embracing 7,490 acres the average yield per acre was 42 bushels and the average value of the crop $35.39 per acre. Both irrigated and non-irrigated lands show a money return per acre that supports the claim that no county in the United States is known where farming is so profitable as in Gallatin county, Montana.

Returns of crops on 80 farms in 1911 have been compiled, a very

BROADWATER
MEAGHER
JEFFERSON
GALLATIN
PARK
MADISON
YELLOWSTONE NATIONAL PARK
IDAHO
Canyon
Josephine
Maud Low
Goodell
Deer Park
Ompard
Clarkston
Gallop
Trident
Sedan
Logan
Sexton
Spring Hill
Manhattan
Brackett
Central Park
Three Forks
Belgrade
Willow Cr.
Sappington
Hyde
BOZEMAN
Greenwood
Bozeman Hot Sprs.
Salesville
Muir
Chestnut
Storrs
Collins Wood Cr.
MT. BLACKMORE
GALLATIN PK.
WILSON PK.
RAMSHORN MT.
Eldrige
MONUMENT MT.
Grayling
Yellowstone
BALD MT.
Maple Cr.
Fishtail Cr.
Cottonwood Cr.
Flathead Cr.
Jefferson River
Madison River
Missouri River
Gallatin River
Yellowstone River
Boulder River
Trail Cr.
Bridger Mts.
Bridger Range
Gallatin Range
Elkhorn Mts.
Crazy Mts.
Big Belt Mts.
Big Belt Range
Little Belt Mts.
Little Belt Range
Tobacco Root Mts.
Tobacco Root Range
Madison Range
Gravelly Range
Snowcrest Range
Centennial Mts.
Henrys Lake Mts.
Henrys Lake
Hebgen Lake
Quake Lake
Earthquake Lake
Red Rock Lakes
Red Rock Lakes Migratory Waterfowl Refuge
Lima Reservoir
Clark Canyon Reservoir
Beaverhead Mts.
Beaverhead Range
Beaverhead River
Big Hole River
Big Hole Mts.
Big Hole Range
Big Hole National Battlefield
Pioneer Mts.
Pioneer Range
Anaconda Range
Anaconda-Pintlar Wilderness
Pintlar Creek
Pintlar Peak
Lemhi Range
Lemhi Mts.
Lemhi Pass
Lemhi River
Salmon River
Salmon River Mts.
Salmon River Range
Continental Divide
Yellowstone Lake
Yellowstone Park
Yellowstone Park Boundary
Yellowstone Park Boundary Line
Yellowstone Park Boundary Road
Yellowstone Park Boundary Trail
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remarkable feature of the report being that in many instances the value of the crop exceeds the market price of the land that produced it. The lowest value per acre of wheat is $27.000 and the highest $65.80; the low yield was 36 and the high 71 bushels of fall wheat; but as the grower of the first named crop had 17,000 bushels he is, no doubt, content. From 640 unirrigated acres near Salesville E. H. Gooch harvested 41,600 bushels of Turkey red wheat, an average of 65 bushels to the acre. The lowest value per acre for oats was $26.00 and the highest $46.40. Of barley the lowest was $37.50 and the highest $61.50. Crops of potatoes that sold for $240 per acre, and of timothy seed $100 per acre are reported.

On a plot at the Montana Experiment Station at Bozeman Director Linfield raised 87.6 bushels per acre of Stanley spring wheat, and J. H. Durston is reported to have raised an average of 91 bushels per acre of Spring club wheat on a four acre tract. F. L. Benepe, formerly president of the Montana State Fair, raised 176 bushels of oats to the acre on ground that grew potatoes last year. The world's record yield of oats was made, it is believed, in 1909 when Rudolf Vogel, Jr., grew on his farm near Bozeman 488 bushels of Swedish select oats on two and one-half acres of ground. J. E. Moore reports a barley yield of 85 bushels to the acre and W. W. Niven of Manhattan 1,015 bushels on 12 acres. L. A. Brittan received $1,700 for timothy seed harvested on 17 acres.

The quality of the grains have caused them to be in demand for seed and for shipment to flouring, cereal and malt mills. Barley has been shipped to Europe, Japan and Australia. Gallatin county grains won many first prizes at the Chicago, St. Louis and Portland Expositions and the costly Pabst cup some years ago at Salt Lake for the best barley in the United States. At the great New York Land Show held at Madison Square Garden, November, 1911, first prizes for wheat, oats, barley and alfalfa were awarded to Montana exhibitors and Gallatin county won two of them. The Pabst cup for the best barley grown in the United States was awarded to R. Eisinga and the Earling cup for the best oats grown in the United States was awarded to Hartman and Patton, T. Menard of the same county being second. Both prize winning crops were grown on land that a few years ago was considered of little value. At the St. Paul Land Show of 1911 many first prizes were won by Gallatin county exhibitors, including the cup for "the best bushel of winter wheat grown in the American Northwest" which was awarded to Frank Smart.

South of Squaw Creek the country is a timbered, mountainous region, with deposits of coal, indications of copper and gold, a region of great scenic beauty and a favorite resort for fishermen and hunters. The pioneer coal mines of the state is at Chestnut.

The main line of the Northern Pacific crosses the county; the Butte branch goes west from Logan; and a branch is being built from Manhattan into the Camp Creek section. The Chicago, Milwaukee and Puget Sound passes through the northern end, and from Three Forks a branch extends through the valley to Bozeman. An electric line owned by this company runs from Bozeman to Salesville.

The chief towns are Bozeman, Three Forks, Belgrade and Manhattan. Less than four years old, Three Forks with a population of nearly 1,500 large business houses, many civic improvements and a growing, busy little city is an example of how towns grow in developing Montana. It is the trading point for a large section, is a division point on the Milwaukee Railroad which has large shops there and pays out monthly a large sum to employes. Manhattan is a milling and shipping point for a productive section. Belgrade is a thriving town in the center of the valley, has large flour mills and elevators, and ships great quantities of grain. Logan is a trading place for the lower Madison valley and is a junction point on the Northern Pacific Railroad. At Trident is a large cement factory.

The county seat is Bozeman, "The Beautiful," a city modern in every respect, with fine residences, surrounded by beautiful lawns and shade trees, churches, schools, business blocks, mills and elevators. The city owns the water works, there are sewers, a paid fire department, paved streets, many miles of cement sidewalks, parks, street care lines, and the grounds of the Inter-State Fair Association. The Montana Agricultural College, the largest educational institution in the state, having nearly 500 students, the Montana Agricultural Experiment Station, the United States local land office and the United States Fish Hatchery are located at Bozeman. It is a beautiful residence and educational city and an important business place. There are flouring mills, a cereal food factory, several elevators, a brewery and numerous small factories. Every year in September Bozeman gives a "Sweet Pea Carnival," an unique festival that attracts thousands of visitors.

Robert Ingersoll called the Gallatin valley "a dimple on the fair cheek of nature," and few sections in the world present so many attractions as a place of residence or for a summer's outing. Many tourists are attracted by the beautiful scenery. The climate is ideal, and the geology so interesting that professors of Harvard University bring students to study it in the field. There are wood, water, grass, freedom from insect pests for compers; the meadows and hills are carpeted with beautiful wild flowers; trout leap in the mountain streams, and for the hunter are grouse, ducks, geese, bear, deer and elk. Prof. F. V. Hayden, the eminent explorer and geologist said: "In no country are the varied phases of scenery better shown than in this. For the artist this country must open up a new world."

Gallatin county has an area of 2,352 square miles. The unappropriated public lands were 333,705 acres in 1908 and 56,374 acres in 1911. The population in 1900 was 9,553 and 14,079 in 1910 an increase of 47 per cent. The assessed valuations in 1908 were $10,563,502 and $14,275,649 in 1911, an increase of 36 per cent in three years.

Further information may be had by applying to the secretaries of the Chambers of Commerce at Bozeman, Belgrade and Three Forks.

GRANITE COUNTY.

Granite is a western county lying east of the Bitter Root valley. Much of it is mountainous the land sloping to the Hellgate river in the north.

Mining, stock growing and farming are the industries. The county includes a very rich mineral area, and mining, which formerly was the overshadowing industry, is carried on in many districts. Near the Deer Lodge county line is great activity in mining at present and in other districts much development work is being done. In the West Fork district is what is believed to be the largest deposit of sapphires in the world. The Granite, the great silver mine from which $40,000,000 have been taken, is near Philipsburg and is still producing in a small way. In many parts of the county are very promising mineral claims that need additional capital to make them producing mines and many opportunities are ready for the capitalist who is willing to take a mining chance.

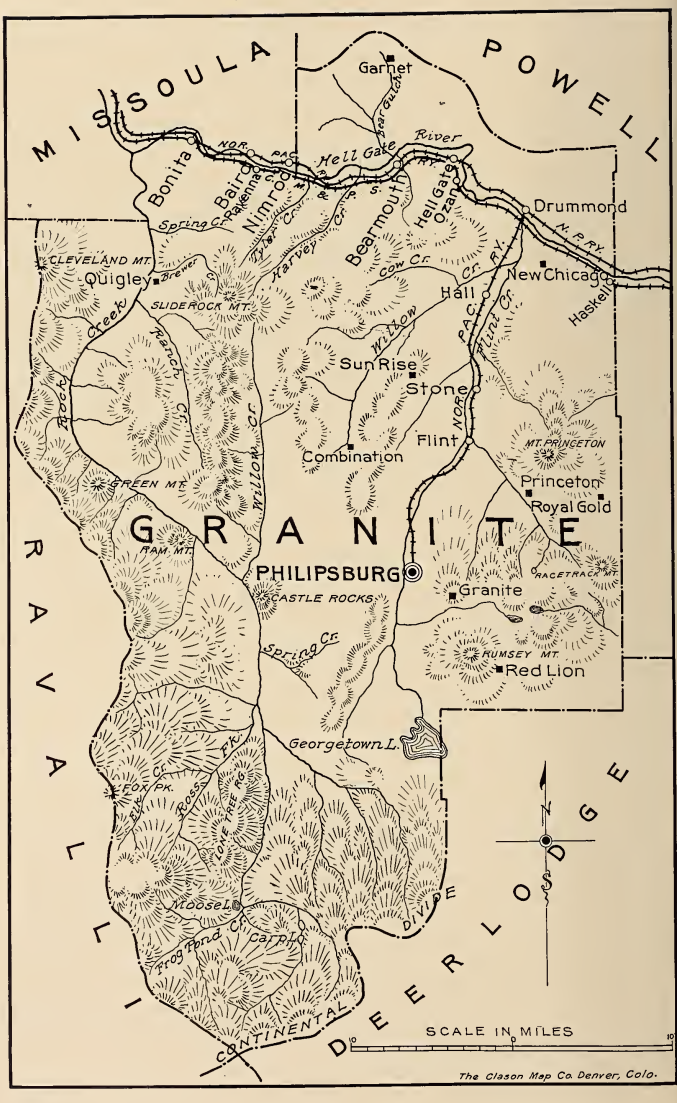
There are many excellent horses and herds of blooded cattle. Dairying is a leading occupation in Flint Creek valley which has many advantages for the dairyman. Creameries at Philipsburg and Hall bear witness to the extent of the business, and numerous prizes won at State Fairs testify to the excellence of the dairy products.

The valleys of Flint and Rock Creeks and Hellgate river contain many acres of irrigated lands that yield profuse crops of grain and grasses. Flint Creek valley extending from Drummond to Philipsburg embraces the most productive agricultural section. The soil is alluvial, rich and deep, and convenient railroads transport grain, grasses, and vegetables to markets close at hand. Excellent improved lands may be bought for from $40 to $100 an acre, and it is said that $11.50 per acre is a conservative estimate of the profit of wheat growing lands. Oats make large yields and crops of 75 to 100 bushels per acre are not uncommon. In Rock Creek valley are many fine ranches. The average production of grain is high, but hay is the chief crop. Mr. Werning averaged four tons to the acre of timothy and clover at a single cutting and sold the hay at Philipsburg, baled, at $15 a ton. Hellgate valley has an easterly and westerly trend and a width in places of more than a mile of rich alluvial soil. The Northern Pacific and the Chicago, Milwaukee and Puget Sound Railways run through it; and its productive lands offer advantages that are equalled at few places.

Farming without irrigation—dry land farming— has been successful. A. P. Smith's notable success is related on another page.

The advantages of the county for fruit growing are attracting attention The suitability of the soil and climate for the successful production of fruits on a commercial scale is shown by several orchards, among them the McGowan orchard of 990 trees at Hall and the orchard of George W. Morse at Drummond.

There are no bottom lands in Granite county subject to location as homesteads, but many acres of bench lands are vacant public land. The unappropriated and reserved public lands in 1908 were 250,698 acres and 188,412 acres in 1911.


MISSOULA
POWELL
RAVALLI
DEER LODGE
Garnet
Bear Gulch
Hell Gate River
Bonita
Baird
Nimrod
Ravenna
Hell Gate
Bearmouth
Ozana
Drummond
N. P. RY.
Spring Cr.
Harvey Cr.
Cow Cr.
Cr. Ry.
New Chicago
Haskell
CLEVELAND MT.
Quigley
Brewer
SLIDE ROCK MT.
Creek
Rapid Cr.
Hall
Willow
Flint Cr.
Sun Rise
Stone
Rock
Willow Cr.
Combination
Flint
MT. PRINCETON
Princeton
Royal Gold
GREEN MT.
GRANITE
RAM MT.
PHILIPSBURG
RACETRACK MT.
CASTLE ROCKS
Granite
Spring Cr.
KUMSEY MT.
Red Lion
Georgetown L.
Ross Fk.
Cr.
FOX PK.
Fk.
Ross Fork Rd.
Moose L.
Divide
Carlton
Frog Pond Cr.
CONTINENTAL
SCALE IN MILES
The Clason Map Co. Denver, Colo.

Philipsburg, the county seat and principal town is the terminus of a branch line of the Northern Pacific Railroad, had a population of 1,109 in 1910, occupies a commanding position upon the upper terrace of Flint Creek valley, has excellent drainage, a good water system, an electric lighting plant, a court house, handsome homes, good hotels, business houses, a bank, a creamery, a foundry, a brewery and a weekly newspaper. The public schools of Philipsburg and the Granite County High School afford excellent opportunities for obtaining a good education. Hall, in the Flint Creek valley, is in the center of a prolific farming section, has an up-to-date creamery, and is known as "Spotless Town." "Within its confines" says a writer "no saloon can abide; money cannot buy a saloon site." Hall has a number of business establishments, is within easy reach of lignite coal mines, and controls the trade of a populous farming district. Drummond, on the main line of the Northern Pacific Railroad where the Philipsburg branch starts, is the trading place for the northern end of the county, has mercantile houses, and men who will be glad to tell of the advantages the neighboring country has to offer to the homeseeker.

There is much timber in the mountains. The Bitter Root national forest embraces a considerable part of the county. Large game finds a retreat within its fastnesses and it is a favorite resort for the hunters and fishermen. Great mountains, beautiful lakes and cascades, are attractions for the landscape artist and for the lover of beautiful scenery.

The main line of the Northern Pacific Railroad crosses Granite county and is paralelled the whole way by the main line of the Chicago, Milwaukee and Puget Sound Railroad. Definite announcement has been made of the intention of the Butte, Anaconda and Pacific Railway to construct a line from Anaconda into the Georgetown mining district in the eastern part of Granite county.

The area of Granite county is 1,617 square miles; the population in 1900 was 4,328 and 2,942 in 1910. The assessed valuation of property in 1908 was $2,408,233 and in 1911 $3,269,533, an increase of 32 per cent.

Further information may be had by applying to the secretaries of the Commercial Clubs at Philipsburg and Drummond.

JEFFERSON COUNTY.

Lying close to the markets of Butte and Helena is Jefferson county where farming and fruit growing are subordinate to mining, the chief industry, and stock growing. Nearly all of the mountains that comprise a great part of the county are mineralized and scores of millions of dollars have been extracted from the mines. There are thousands of mineral claims and many producing mines. Mining is active in the rich Elkhorn district, in the Corbin Wickes neighborhood, where great sums have been spent in the last few years in development work in mines that should soon be large producers of copper, and at Clancy, Boulder, Basin, Amazon and other places.

Stock growing has been an important and prosperous industry from early days. The native grasses furnish good food, little winter feeding is

LEWIS AND CLARK
POWELL
BROADWATER
DEERLODGE
SILVERBOW
MADISON
GALLATIN
JEFFERSON
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Corbin
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Amazon
Fuller
Basin
Calvin
Elkhorn
Queen Siding
BOULDER
Bernice
Lockhart
Wilder
Elk Park
Trask
Finn
Coldspring
Cavern
Jefferson Is.
Cardwell
Whitehall
Pipestone Spg.
Welch
Homestake
Hot Springs
Piedmont
Vendome
Renova
Cedric
Whitetail Cr.
Boulder R.
Jefferson R.
Boulder Cr.
Basin Cr.
Fuller Cr.
Calvin Gulch
Orchard Gulch
Elk Park Gulch
Trask Cr.
N. P. R.R.
C. M. & P. S. Ry.
Ry. Jefferson
SCALE IN MILES
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The Cleson Map Co. Denver, Colorado.

necessary, and many horses and cattle are shipped every year. In the mountains are large areas of good grazing lands that are not adapted for farming and the permanency of the stock industry is assured.

The area devoted to farming increases yearly. Farming without irrigation has been successful in many cases, but the chief production is from irrigated lands in the Jefferson and Boulder valleys. The Jefferson valley about 35 miles long, extends from the canyon on the east to Waterloo on the west and embraces Jefferson Island. White Tail Deer, Fish, and Pipestone creeks water this section which contains many fine farms. The Boulder river has a long valley in which are situated many productive grain and stock ranches. Prickly Pear valley has the advantage of being near Helena.

Oats, winter wheat, rye and hay are the chief crops. Irrigated oats yield from 25 to 50 bushels per acre and a bushel often weights 44 pounds. Winter wheat and rye yield from 30 to 50 bushels on irrigated and from 15 to 40 on non-irrigated land. Native grasses make excellent hay and alfalfa yields from 3 to 6 tons to the acre. For butter, eggs, vegetables and fruits the many mining camps supply a market and the markets of Butte and Helena are in part supplied from this county. Diversified farming is pursued by many and dairying is profitable. Hardy apples produce abundantly. Excellent opportunities are present for the farmer, fruit grower, dairyman and gardener as well as for the capitalist who will help to develop mines and the stock grower. In addition to precious metals are deposits of limestone and cement rocks. The excellent granite that was used to construct the wings of the State Capitol was quarried in Jefferson county only ten miles from Helena. In the limestone formation north of Jefferson canyon is the wonderful Lewis and Clark cavern, one of the most beautiful and extensive caves in America.

Boulder, the county seat, is situated in the central part of the county, thirty-seven miles from Butte and thirty-five miles from Helena. It is a thriving town with good schools, churches, banks, business houses, a newspaper, and many attractive residences. It is the home of the State School for the Deaf and Blind.

Whitehall is the chief trading point in the southern part of the county and of the Jefferson valley. It is perhaps the most populous town, is a railroad junction point and has good schools, churches, and large business establishments. Piedmont, a new town on the Milwaukee road, is in a good farming section. Many orchards have been planted, and vegetables are extensively grown. The excellent potatoes served on the dining cars are grown near this place. Basin, in a mining region, is where the Heinze mill and reduction works are situated and has commercial establishments, churches and schools. Clancy, on the Great Northern, is in a prosperous mining and agricultural region and is an important railroad point. Corbin and Wickes are centers of mining activity. Elkhorn is where the famous Elkhorn group of mines is located.

In Jefferson county are four noted mineral springs that are visited by many invalids, who are benefited by the waters, and by many others in

search of recreation. Alhambra and Sunnyside are on the Great Northern Railroad 15 miles south of Helena and have excellent accomodations. Boulder Hot Springs are near the county seat and a costly hotel building has recently been erected. Pipestone Springs, on the Northern Pacific Railroad 26 miles from Butte, is a favorite resort. Analyses of the water of these springs may be had on application to the managers.

In the Jefferson valley are the lines of the Milwaukee and Northern Pacific Railways and the latter road has a branch line extending from Helena to Elkhorn. The Great Northern passes through the northern part of the county and affords railroad facilities for the mining camps. A survey has been made for an electric line from Helena to Butte.

The average wealth and production per capita is high, and there are attractive opportunities for the homeseeker and the capitalist to acquire land at its present low valuation and to invest in mining claims that need capital to develop them.

The population was 5,330 in 1910 and 5,601 in 1910. The assessed valuation of property in 1908 was $5,132,900 and in 1911 $5,934,079, an increase in three years of 15 per cent.

The unreserved and unappropriated public lands in Jefferson county in 1908 were 274,310 and 231,463 acres in 1911.

Further in formation may be obtained by applying to the secretaries of the Commercial Clubs at Boulder and Whitehall.

LEWIS AND CLARK COUNTY.

Lewis and Clark county contains the capital of the state and is conveniently situated. The greater part is on the east side of the Rocky Mountains and the slope of land is to the Missouri river which runs through it in a northeasterly direction and receives several important tributaries.

Mining, stock growing and farming are the occupations of the country residents and commercial and manufacturing pursuits employ large numbers in the cities. The county embraces a very extensive and rich mineral belt and mining has been successfully carried on since 1864 when the wonfully rich placers of Last Chance gulch, now included within the limits of Helena, were discovered. Many other placers were productive, and every year a considerable quantity of placer gold is recovered. Much land that could be profitably worked with a gold dredge will, it is thought, be found on exploration. One gold dredge costing $150,000 was installed in 1911 at Magpie near Canyon Ferry and a large increase of placer gold production is expected as a result of its operations. Near Lincoln, on the west side, are placer grounds that have been yielding gold for many years. Lewis and Clark county is one of the foremost quartz mining districts in the world and mines are producing in nearly every section. Mines at Unionville, a few miles south of Helena, have produced many million dollars worth of gold. The Springhill and other great mines are in this neighborhood. In either direction from Helena mining camps are found only a few miles apart. The principal mining town is Marysville where many large mines are producing. It is reached by a branch line of the Northern

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TETON
POWELL
CASCADE
JEFFERSON
BROADWATER
LEWIS AND CLARK
MEAGHER
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PENTAGON MT.
ROCKY MTS.
Sun River
Carey
Augusta
Hogan
CONTINENTAL DIVIDE
SCAPEGOAT MT.
Clemons
TWIN MTS.
Dearborn River
Stearns
Fulton
Wolfcreek
Craig
Holter
Fleshers
Lincoln
Manilaor
Stemple
Gould
Mitchell
Wilborn
Canyoncreek
Johns
Silver
Marysville
Baldbutte
Cyanide
Clough
Birdseye
Austin
HELENA
E. Helena
Nelson
Hauser Lake
York
Canyon Ferry
Hauser L.
Missouri River
Rimini
N. P. RY.
G. N. RY.
SCALE IN MILES
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The Clason Map Co. Denver, Colo.

Pacific from Helena, 21 miles distant. Gould is in the same section. Rimini in the southern part 18 miles from Helena is the terminus of another branch line.

To treat the ores of this and adjoining counties the American Smelting company operates a smelter at East Helena where a large number of men are employed. East Helena is a considerable town and is connected with Helena by an electric railway.

Stock-growing has been followed successfully from early days and a new development is the fattening for shipment to market of stock in the Prickly Pear valley. The chief agricultural districts are in the valleys of the Prickly Pear and Missouri rivers near Helena and in the northern part of the county from the Dearborn to the Sun River. Farming development has been stimulated in the Augusta neighborhood by the beginning of the construction of a railroad from Great Falls, and in the country near Helena by the success of crops at the experiment station near East Helena where in 1911 on unirrigated ground yields were made of 38.13 bushels of Sixty Day oats, 43.31 of Sweedish Select oats, 25.30 of barley, and 27.67 of Turkey Red wheat. Individuals have made as large or larger yields and the experiments show that it would be profitable to farm the 300,000 acres of virgin lands tributary to Helena. Fruits also grow successfully and several orchards have been set out. Soil and climatic conditions are favorable for the Prickly Pear valley becoming a great fruit district, and for fruits, vegetables and farm products there would be a ready market at Helena and in the mining towns.

The wonderful power that is furnished by the electric plants on the Missouri river is to be utilized, if present plans are carried out, to pump water from Hauser Lake to irrigate about 30,000 acres of land in the Prickly Pear valley, and the agricultural development of the country around Helena by this means and by the extension of farming of unirrigated lands is likely to be rapid in the next two years. The northern part of the county has received many new settlers in the past two years and promises to become one of the most productive farming districts in the state. Augusta is the trading point for this region.

Helena, the county seat, is the capital of Montana, is a commercial, financial and political center. It is an attractive place of residence, is said to be the richest city per capita in the United States, and many costly residences and business blocks testify to its wealth. The city has recently purchased the water company's plant and ended a long drawn out litigation. The enterprising citizens have recently raised $400,000 to build a new hotel and are collecting a large amount to increase the endowment of the Montana Wesleyan University. The Deaconess School for young children is well established and there are two business colleges. The Catholic Church has parochial schools, a high school, graded schools for boys and girls, and a high school occupying a $500,000 building, St. Vincent's Academy conducted by the Sisters of Charity as a school for girls which has been long established and has a large attendance, and Mt. St. Charles

College for boys which was opened in 1911 and has splendid buildings. A Cathedral is nearing completion that will be one of the most beautiful church buildings in America.

Helena has many churches and is the center of much religious activity. The Episcopal bishop of Montana, the Roman Catholic bishop of the diocese of Helena, and official leaders of other denominations reside here. Hospitals, asylums, and benevolent institutions are numerous.

The Capitol, a splendid building to which two large wings have been added in the past year, contains the offices of various state executive officials, the supreme court, and the chambers of the two branches of the Legislative Assembly. The Montana State Fair is held every fall on grounds near the city and is attended by many thousand visitors. The federal courts meet in Helena and the chief federal officers for the state have offices in the city. An assay office and a land office are located there and the headquarters of the chief engineer of the reclamation service. Fort Harrison, a well equipped fort with a large garrison, is situated close to the city.

Helena has all the advantages and conveniences that are to be found in a modern and progressive city with public, business and residence buildings that compare favorably with those of any city whatever its size, and has some advantages peculiar to itself, such as the largest natatorium in the world and one of the greatest developments of water power on the continent. Two immense dams and generating plants have been completed and a third is under construction. The three dams develop a total head of 220 feet and will make available 100,000 horse power. This abundant and cheap power is available for use on the farm and in the mines, is transmitted in large quantities to Butte, and is an advantage for manufacturing plants that few cities possess. This almost unequalled power, the location of the city near districts that produce large quantities of grain, and the excellence of the railroad facilities are expected to unite in making Helena a flour milling center as well as to be reasons for other manufacturing establishments to be started. Helena is an important jobbing center and goods are shipped to all parts of the state. The manufactures are crackers, candies, soap, spices, extracts and baking powders, brick and clay products. There are two breweries, an iron foundry and planing mills. There are two daily and seven other newspapers and five large printing establishments.

Helena is a railroad center being on the Northern Pacific main line and the place from which the Rimini and Marysville branches start. The Great Northern, through the Montana Central division, gives communication with the main line at Havre, the Burlington at Great Falls and the Oregon Short Line at Butte. The big event in railroad construction in 1912 is expected to be the building of the Mondak-Helena cut-off of the Northern Pacific which will open up much farming and mineral lands near the city that are distant from railroads and bring the central eastern part of the state into close business relations with Helena. It is expected, also, that the Milwaukee railroad will build into Helena, and a line has been sur-

veyed and a company formed to construct an electric line from Helena to Butte. The railroad pay-roll is a factor in the city's business and is likely to be increased by the enlargement of shops and an increase of the force in the operating department. Passenger trains of two roads come into one of the best union stations in the northwest but the Great Northern intends to build for its own use a separate and more commodious station.

Lewis and Clark county is filled with opportunities, farming, fruit growing, mining and manufacturing, and is on the eve of great growth in all these lines. Lands are on sale at low prices. The vacant and unappropriated public lands in 1908 were 1,007,581 acres and in 1911 946,710 acres. The assessed valuations were $19,313,175 in 1908 and $20,931,129 in 1911, an increase of eight per cent.

Further information may be had by applying to the secretaries of the Commercial Clubs at Helena and Augusta.

LINCOLN COUNTY.

Lincoln county in the northwestern corner of Montana was created in 1909 from a part of Flathead county, is drained by the Kootenai river and its numerous tributaries, is well watered, springs, streams, and lakes being numerous, has great undeveloped water power, and much scenery of remarkable beauty, including Blackwell glacier. Hunting and fishing attract many visitors.

The industries are lumbering, mining, farming and fruit growing. The greater part of the county is heavily timbered, and large lumber mills operate at Libby, Eureka, Warland and Fortine. The quantity of timber is estimated at 20,000,000,000 feet, and the permanent importance of the lumbering industry in which are employed large numbers of men and horses is assured. The lumber camps furnish a local market for farm products, and the wages of the workmen contribute largely to the business of the towns.

The mineralized area is extensive and rich. In the southwestern part is the Libby silver-lead mining district whose rocks are said to be a counterpart to those of the rich Coeur d'Alene district of Idaho. The Snowshoe mine in this district has produced about $1,000,000. About 40 miles southeast from Libby are the West Fisher gold fields where many discoveries of rich ores have been made and much development work done. As soon as a railroad is built into this district it will begin to produce large quantities of gold. In the northern part near Eureka are also promising mineral claims; and the Yakt district, in which is Sylvanite, contains much mineral wealth. The quartz mines present many opportunities for the successful investment of capital in their development. The building of a smelter at Libby will give a great impulse to the mineral development of this section. The Libby placers were among the first discovered in Montana and have been producing gold since the early sixties.

Hydraulic mining followed ground sluicing, and gold dredges may be used where the ground is favorable. Tobacco Plains is the largest area without a growth of timber, smaller tracts of the same kind exist in other

DOMINION OF CANADA
IDAHO
FLATHEAD
SANDERS
LINCOLN
Gateway
Hayden
Rexford
Eureka
Tobacco
Marston
Rondo
Fortine
Stonehill
Trego
Stryker
Sylvanite
Tweed
Ural
Volcour
Warland
Troy
Yarnell
Rankin
Kootenai Falls
LIBBY
Ripley
Jennings
Lakeview
Island Lake
Snowshoe
Cabinet
Horseshoe I.
Thompson I.
Loon L.
Yaak
Kilbrennen L.
Pleasant Valley
Big War Cr.
Wolf Cr.
Fisher R.
Cabinet Mts.
Purcell Range
Whitefish Range
Kootenai R.
Clarence
Stanley Cr.
Spar L.
Bull L.
Deep Cr.
Snow Cr.
Flower Cr.
Keeler Cr.
Callahan Cr.
Rainy Cr.
Young Cr.
Grave Cr.
Moose Cr.
Dickey L.
Deep Cr.
Bristow Cr.
Canary Cr.
Quinn Cr.
Fortune
Tobacco R.
Yaak R.
Yaak River
Kootenai River
Purcell Range
Whitefish Range
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SCALE IN MILES
10 0 10 20 30 40
The Clason Map Co. Denver Colo.

sections, and the area of farm lands has been added to by clearing timber lands. Throughout the county the conditions of soil, rainfall and climate are such as to insure prolific growths of all grains, grasses, vegetables and fruits. The average rainfall being about 24 inches, irrigation is not necessary and the altitude, away from the mountains, is low being 2,308 at Eureka, 2,113 at Jennings, 2,055 at Libby and 1,881 at Troy. The growing season is long, and local markets for farm products are convenient. Oats and hay are the chief crops. Enormous growths are attained. The Eureka Journal publishes accounts of stalks of winter wheat six feet high, of winter rye nearly seven feet high, of timothy six feet high, and of oats nearly seven feet high. J. M. Kennedy on his ranch near Libby dug 79 potatoes from one hill, the total weight was 31 pounds and 51 were of commercial size. A potato weighing 4 1-2 pounds was raised by A. C. Herbst. A sunflower 14 feet high and cabbages weighing 20 pounds were exhibited at the county fair. Onions make large yields; and a visitor carried away from Libby to show at his home a rutabaga that weighed 13 1-2 pounds and a mangelwurtzel 14 1-2 pounds.

Lincoln county is destined to become a great fruit growing district, all the conditions being present for the successful production of high grade fruits. Strawberries over eight inches in circumference are reported from the Reed farm near Eureka; and the Libby News says that Jos Cechlovsky brought into that town one hundred crates of strawberries that averaged seven berries to the foot, or an inch and a half to the berry. From 18 seven-year-old pear trees near Libby one hundred bushels were gathered. A Bellefleur apple that weighed a pound was picked from Mr. Wood's orchard near Troy.

The development of this fertile county has been retarded by the action of the government in putting into forest reserves 1,964,850 acres of land much of which is said to be of value for farming and fruit growing. While a few tracts have been released from reservation the local opinion is that many thousand acres in the Kootenai valley should be eliminated from the national forests. Concerning these lands Louis W. Hill, president of the Great Northern Railroad and son of James J. Hill, wrote in 1910 a letter to the editor of the Libby News the concluding paragraph of which is:

> Our business men were greatly interested and pleased with the visit Governor Noris paid us recently and were greatly impressed with his able address delivered at the luncheon we tendered him, on which occasion my father stated that the lands of the Kootenai valley forest reserve, when turned open to settlement, should eventually be worth as much as the Wenatchee lands that range in price from $1,000 to $2,500 per acre. This is a strong statement, but I think your valley will prove it true.

Few sections of the country offer better opportunities for farmers, fruit growers, miners and capitalists than Lincoln county whose great resources are in the infancy of development. Farming and fruit lands are on sale at low prices and logged-off lands offer great opportunities for the home-seekers who will clear and convert them into farms and orchards. Very great benefits to country districts as well as to the towns will follow the construction of bridges and roads that are to be built in 1912 as a result

of the election that authorized the sale of bonds to procure means for these needed public improvements.

The Kootenai river drops 60 feet at Kootenai Falls and 40 in the rapids, making a fall of 100 feet in a mile. The minimum water power is 207,000 horse power. A company has been formed that intends to develop 80,000 horse power at Kootenai Falls at an estimated cost of $6,000,000. Work is expected to begin in the spring of 1912 and the plan is to transmit the power not needed for local use to Spokane, Sandpoint, and the Coeur d'Alene district. Power on the Yakt river is also to be utilized.

The principal towns, all one the Great Northern line, are Eureka, Libby, and Troy. Eureka is the chief trading point for the Tobacco Plains country, has electric light, water works, churches, schools, a bank, a creamery, a newspaper, business buildings and attractive residences. Large saw mills give employment to many men. The town is surrounded by a very productive farming and fruit district and immense forests are in the neighborhood. Copper, cement rock and marl are mineral assets. Eureka is a growing town, and has openings for a flour mill, a cement plant and brick factory.

Libby, the county seat, is on the Kootenai river, had a population of 630 in 1910, has fine public, business and residence buildings, hospitals, churches, banks, newspapers, numerous stores, a water works, electric lights, many miles of graded streets and cement side walks. Libby is in a great timber district and has large saw mills. The tributary country is rich in mineral, has beds of marble and includes part of the Kootenai valley orchard district besides many acres of good farming land. Libby is growing rapidly; and as inducements for manufacturers, has cheap fuel, available water power, clay, timber for wood pulp, excelsior and lumber.

Troy has a population of about 500, has a public school, hotels, stores, sawmills in the neighborhood, is the supply point for mining and lumbering districts, and is surrounded by lands where, because of low altitude, fertility of soil and long growing season, the most favorable conditions are found for the growth of tender as well as hardy fruits and vegetables.

The main line of the Great Northern passes through the county and a branch line from Rexford runs north into the Fernie district of Canada. Other lines are expected to be built into this productive region.

The vacant and unappropriated public lands in 1911 were 3,785 acres described as "mountainous, timberland." The area of the county is 3,391 square miles, and the population in 1910 was 3,638. The assessed valuation of property in 1910 was $5,165,801 and $5,242,564 in 1911.

Further information may be had by applying to the secretaries of the Commercial Clubs at Eureka, Libby and Troy.

MADISON COUNTY.

Madison, a county of the southern tier, was the scene a much of the eventful history of pioneer days. It contains Alder Gulch, discovered in 1863, which has produced more gold than any similar area in the world and is still producing. At the mouth of the gulch are the large dredges

JEFFERSON
SILVERBOW
Parrot
Lahood
Alcazar
Pippington
Waterloo
PARSONS BRIDGE
Harrison
Silverstar
Camp Cr
Harbison
Iron Rod
Mammoth
Melrose
Rochester
Pony
JEFFERSON PK
Norris
Hot Spgs Cr
Twin Bridges
Lavon
Pageville
Sheridan
Meadow Creek
Mc Allister
WARD PK
Spanish
RED KNOB
Blaine
Laurin
Ennis
Jeffers
Ruby
Adobetown
Alder
VIRGINIA CITY
GALLATIN
RANGE
LONE PK
MADISON
Puller Sp
Cameron
SPHINX MT
Homepark
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of the Conrey Company which handle at large profit great quantities of gold bearing dirt. Quartz mining followed placer mining, and Madison has produce more gold than any other county in the state. Frequently it leads in the monthly reports of gold production. The greater part of the county is a mineralized region and numerous mining camps exist. Silver Star, Iron Rod, Twin Bridges, Rochester, Sheridan, Virginia City, Pony, Norris and Red Bluff are towns that are surrounded by rich mining districts. In addition to gold, silver, copper and lead are ores of tungsten, iron, and manganese, pure limestone and coal. Sapphires and rubies are found in placer diggins. In the numerous mining districts are many good opportunities for the prospector, the miner, and the capitalist.

Mining, stock growing and farming are the three leading industries. Some of the best bred horses, cattle and sheep in the United States are in this county. King Brook, a horse born at the Larrabee ranch in the Ruby valley, established in 1911 a trotting record for the Pacific Coast. Fine herds of cattle are numerous, and much attention has been paid to improveing the breeds of sheep. Horses, cattle and sheep are shipped in large numbers each year and sell at prices that prove their quality.

Madison county contains timbered mountain ranges, long rapid rivers, extensive and fertile valleys, and is watered by the Madison, Jefferson, Ruby, Beaverhead and Big Hole rivers and their numerous tributaries. An immense quantity of hydro-electric power is available, part of which is being utilized by the Madison River Power Company which has built seven miles from Norris, a dam across the Madison river and established a large plant that generates 20,000 horse power the year around. The power is transmitted to several points in the county, to Butte and Anaconda on the west, and to Bozeman, Livingston, Billings and other places on the east. At the upper Madison canyon the same company has built an immense dam and will harness a great power beside storing large quantities of water for irrigating purposes.

A mountain range forms the eastern boundary, another is in the center, and a third in the western part. The chief agricultural districts are in the valleys between the ranges. The Jefferson valley extends from the northern boundary to Twin Bridges where the river is formed and embraces in its own drainage basin and those of the South Boulder and Willow Creek a great extent of excellent farm land. South of Twin Bridges are the Beaverhead and Ruby valleys, the former about 15 miles long and five wide and the latter which is about 30 miles long and from one to three wide. The extensive area in these valleys contain many highly improved and very productive farms. The trading points are Waterloo, Twin Bridges, Sheridan, Laurin and Alder. A part of the Willow Creek valley is in Gallatin county but the upper part is in Madison county and extends to Pony and Norris. South of Norris is the Madison valley about 36 miles long, and including bench lands about 5 miles wide. Development as a farming region has been delayed by the lack of railroads. Large crops of oats, wheat and hay are raised. Meadow Creek, McAlister, Ennis, Jeffers, Cameron and Lyon are post-offices in this valley which has room for at

least five times its present farming population. Many excellent stock ranches are in this section.

In the valleys are irrigated areas and on the benches farming without irrigation has been successful. Several projects are pending that will increase the acreage of irrigated lands and some of the large ranches are being subdivided and sold in farm lots.

The chief crops are wheat, oats and hay. The soil through the county is fertile and large crops are the rule. Crop reports have been gathered this year from many farmers in different sections; fifty bushels of wheat, eighty bushels of oats, three and four tons of alfalfa are not rare yields. Higher yields are reported: The oat crop of J. H. McDonald of Alder yielded an average of 107 bushels to the acre. Peter Simonsen of Laurin raised 60 bushels of barley per acre; and on the Jeffers ranch in the Madison valley the wheat threshed an average of 71 bushels to the acre. The average of the large acreage reported is very high for all crops.

Potatoes are extensively grown and make large yields. P. Carney of Waterloo had 35 acres in potatoes and the yield was 250 bushels to the acre. Mr. Carney exhibited thirteen varieties of potatoes at the Montana State Fair and was awarded the Hill trophy for the best exhibit of ten varieties or more; and at the St. Paul Land Show he won the cup for the "best individual display of potatoes."

Excellent strawberries are grown and are a profitable crop. Many orchards have been set out in the past few years and Madison county promises to become an important producer of apples.

The county is sparsely settled and offers unusual advantages to the homeseeker who desires to secure farming and fruit lands by purchase at low prices. The markets of Butte and Anaconda are convenient and fruits, dairy products, eggs and chickens, are always in demand.

Although the county has no town of more than 1,000 population, there are two newspapers at Virginia City, and Sheridan, Twin Bridges and Pony each has one. The principal places are Virginia City, the county seat an important commercial and mining center, a rich town and of great historic interest having been the territorial capital; Pony a mining town and trading point for the Willow Creek country; Sheridan, a pretty and thriving town, surrounded by rich farm lands and near producing mines; and Twin Bridges, which is situated at the head of Jefferson valley near the confluence of the Ruby, Beaverhead and Big Hole rivers and at the outlet of the valleys of those rivers. Twin Bridges possesses a favorable location for growth in size and business importance and undoubtedly has a very bright future before it.

At the Madison county fair which is held every September at Twin Bridges many excellent products are displayed and some are sent to the State Fair, where Madison county always wins a number of prizes. Twin Bridges wants and will encourage water works, electric light plant, steam laundry, excelsior factory, grain elevator, cereal food mill, creamery, beet sugar factory and farmers.

The State Orphans' Home is at Twin Bridges and occupies buildings

that have been erected at a cost of $110,000. It has numerous inmates and is well supported by appropriations for its maintenance.

The Northern Pacific has a branch line extending from Whitehall to Alder and another from Sappington to Pony and Norris. An electric line from Alder to Virginia City is contemplated. The extension of the Pittsburg and Gilmore railroad from Dillon to Twin Bridges and Whitehall is a probability of the near future. The construction of a road in the Madison valley would open up a very extensive section.

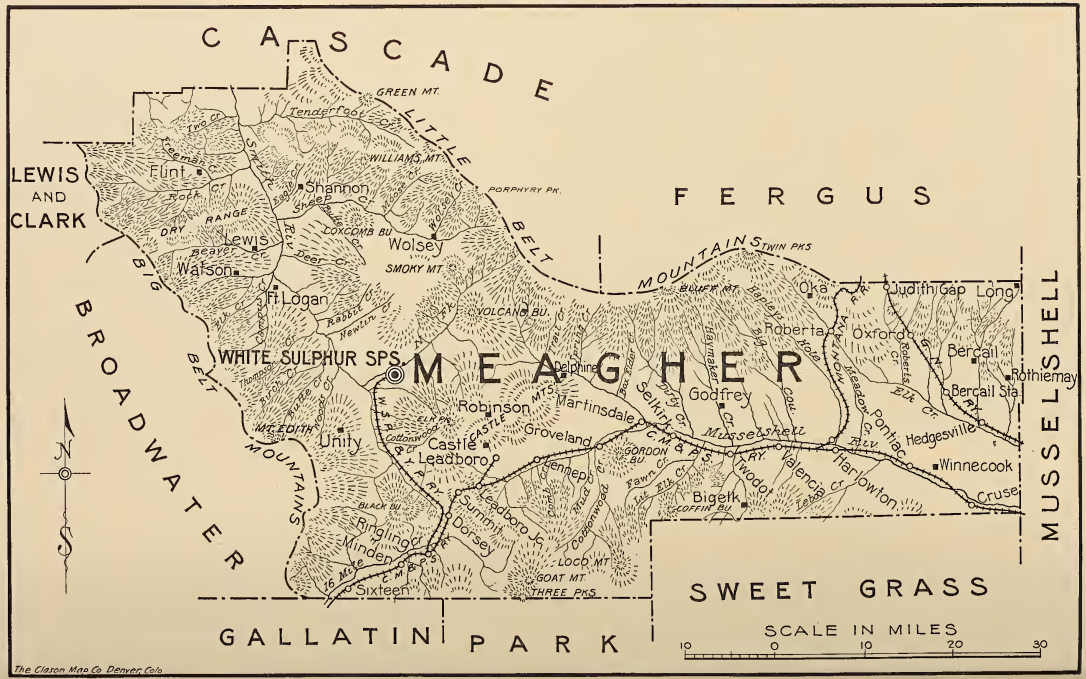
The unappropriated and unreserved public lands in Madison county in 1908 were 1,527,412 acres and 1,197,152 acres in 1911. The population was 7,695 in 1900 and 7,229 in 1910. In 1911 the Centennial valley, a large district, was taken from Madison and put in Beaverhead county. The assessed valuations in 1908 were $6,309,319 and $6,431,426 in 1911.

Further information may be had by applying to the secretary of the Madison County Development League, Twin Bridges.

MEAGHER COUNTY.

Meagher, a central county, is separated from the Missouri valley by Belt range and from Fergus county by the Little Belt mountains, and in the southern part are the Crazy mountains. The topography gave a certain isolation that was broken when the Montana Railroad was built from Lombrda; afterwards it was extended and has been rebuilt since the Milwaukee acquired it. A railroad from the main line to White Sulphur Springs which was built in 1910 may be extended down Smith river, and the Mondak-Helena line of the Great Northern will penetrate a section that is now without railroad facilities. The Billings and Northern division of the Great Northern crosses the southeast corner.

Smith and Musselshell rivers and Sixteen Mile Creek head in this county and springs and streams are numerous. The chief farming districts are the Smith river valley in the northern, and the Musselshell valley in the southern part and the country around Judith Gap. The county has long been and is still a great stock country. Large tracts of land were acquired by stockmen who ranged cattle and sheep on the open range and raised hay and grain for their own use to be fed during the winter. Lands in the valley were irrigated and it is only within a few years that farming has been carried on to any extent on unirrigated land. Irrigated lands in the Smith river and Musselshell valleys produce large crops of wheat, oats, barley, timothy, alfalfa and vegetables. The Smith river valley is about 50 miles long by 10 or 12 miles wide. Stock growing is the chief industry but many acres of the valley and bench lands that formerly were devoted to raising hay and to pasture are being planted to grain, and a very extensive area will be put in crops when a railroad is built through the valley. The soil is very fertile; yields of 50 to 75 bushels of oats, 35 bushels of winter, 53 bushels of spring, wheat, 2 to 4 tons of hay are reported. On the Catlin ranch it is said that 30 bushels of flax to the acre have been raised. Oats often weigh 45 to 48 pounds a bushel. Many prizes have been won by Meagher county exhibits at State Fairs. Another very productive section is the Musselshell valley where are some of the largest and


CASCADE
LITTLE BELT MOUNTAINS
LEWIS AND CLARK
FERGUS
MUSSELSHELL
BROADWATER
SWEET GRASS
GALLATIN
PARK
MEAGHER
WHITE SULPHUR SPS
Flint
Shannon
Lewis
Watson
Ft Logan
Wolsey
Unity
Castle
Leadboro
Robinson
Martinsdale
Groveland
Selkirk
Godfrey
Roberta
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Judith Gap
Oxford
Bercail
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Hedgesville
Winnecook
Cruse
Harlowton
Valencia
Trodor
Bigelk
Dorsey
Ringling
Minden
Sixteen
Dolphine
Summit
Leadboro Jct
Cedarwood
Loco Mt
Goat Mt
Three Pks
Porphyry Pk
Williams Mt
Smoky Mt
Volcano Bu
Bluff Mt
Twin Pks
Green Mt
Tenderfoot Cr
Two Cr
Freeman Cr
Rock Cr
Shannon Cr
Sheep Cr
Loxcomb Bu
Deer Cr
Beaver Cr
Dry Range
Big Timber Cr
Yellowstone R
Newlon Cr
Rabbit Cr
Thompson Cr
Elk Pk
Mt Edith
Cottonwood Cr
Castle Mts
Elk Pk
Black Bu
16 Mile Cr
Sheep Cr
Dry Cr
Big Timber Cr
Duck Cr
Selkirk Cr
Missouri R
Musselshell R
Pontiac Cr
Roberts Elk Cr
Elk Cr
Fawn Cr
Elk Cr
Coffin Bu
Gordon Bu
Valencia Cr
Elk Cr
Deadwood Cr
Mud Cr
Cedarwood Cr
Dorsey Cr
Summit Cr
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Dry Cr
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finest ranches in the state. Around Martinsdale, Two Dot, and Harlowton are many productive farms both irrigated and unirrigated. The benches between the valleys are being farmed with success, the soil being fertile and the annual rainfall 19 inches.

Great development has taken place in the country near Harlowton, and around Judith Gap and Hedgesville on the Great Northern. Average yields yields of grains are high and some remarkable ones are reported. Thirty bushels of winter wheat is a common yield and one as high as sixty bushels is reported. Oats on George Finch's farm threshed 60 bushels to the acre, and he secured 6,000 bushels of winter wheat, some of it averaging 40 bushels an acre. John Allard threshed 5,500 bushels of winter wheat from 150 acres and 350 bushels of flaxseed, 25 to the acre. Wheat near Harlowton averaged 35 bushels and sold as No. 1, and flax went ten bushels to the acre. The Harlowton News says August Oelrichs sold to the Great Northern railway six cabbages that weighed 22 pounds, bushels of potatoes averaging more than a pound each, two bushels of carrots averaging five pounds each, one bushel of turnips averaging about 10 pounds each and one bushel of beets averaging about 5 pounds each.

The report of the clerk of school district No. 24 shows how rapidly the country is growing. The assessed valuation of the district increased from $187,220 in 1910 to $360,899 in 1911.

Ores of gold, silver, copper, lead, zinc and iron exist. Near Delphine is some activity in mining.

White Sulphur Springs, the county seat, is picturesquely situated near the head of Smith River valley eighteen miles from the Milwaukee railroad with which it is connected by the White Sulphur Springs and Yellowstone Park Railroad. The waters of the wonderful springs that give name to the town possess healing qualities of great value. The water has a copious flow at 110 degrees. The springs have been bought by John Ringling, the circus owner, who intends to erect there a large and costly hotel and to provide the conveniences of a great health resort. The town has a high school, graded schools, three churches, banks, two newspapers, hotels and stores. Some of the large ranches in the neighborhood are being sold in small lots and the population and business of the town is increasing.

Harlowton, in the Musselshell valley where the Judith Basin line joins the main line of the Milwaukee, is the chief town and has experienced great growth in population and business in the last three years. It is a well built, busy and growing town, and has a large hotel, business houses, banks, a newspaper and is the distributing point for a large agricultural and stock district. Railroad shops and a railroad pay-roll contribute to its prosperity.

Judith Gap, on the Billings and Northern division of the Great Northern at the entrance to Judith Basin, is a flourishing new town in a very productive section. It is a division point on the railroad and in the large round houses and shops and in the operating department many men are employed. The town has a newspaper and numerous business houses and hotels.

Meagher county offers excellent opportunities for the homeseeker to

acquire good lands by purchase.. Back from the valleys homestead lands may be found. The unreserved and unappropriated lands in 1908 were 631,408 and 402,914 acres in 1911. The population in 1900 was 2,526 and 4,190 in 1910. Meagher county lost 41 square miles and property assessed at $18,796 and gained 73 square miles and property assessed at $233,600 as the result of changed boundaries caused by the creation of Musselshell county. The assessed valuations in 1908 were $4,869,370 and $8,367,364 in 1911, a gain of 70 per cent.

Further information may be had by applying to the secretaries of the Commercial Clubs at Whit Sulphur Springs, Harlowton and Judith Gap.

MISSOULA COUNTY.

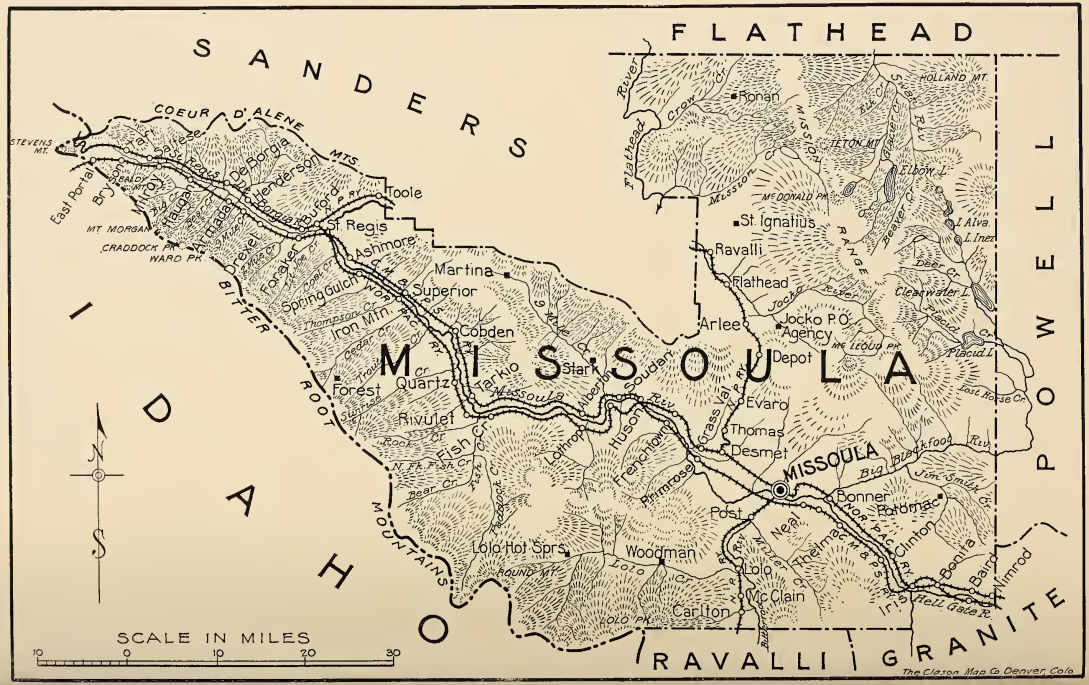
Missoula which is one of the most important and populous of the counties of the Treasure State adjoins Idaho. Nature has provided a fertile soil, a delightful climate and grand scenery; and its many advantages and opportunities have drown together an energetic and progressive class of citizens who are devoted to their locality. They have ample reason to be proud of what has already been accomplished, although only a beginning has been made in the development of a country of great and varied resources. It is, indeed, a garden spot reveling in fruits and flowers, magnificent trees and balmy atmosphere, copiously watered, with mountain and plain offering abundant reward to well directed industry.

The industries are mining, lumbering, farming and fruit growing. "The mineral areas of Missoula county," says the State Mine Inspector, "are both extensive and attractive, offering as good opportunities to the prospector and to the capitalist as can be found in any of the mineral districts of the Rocky Mountain region." Many properties are being worked or explored, and an important development of the year 1911 was the installation of a gold dredge at Kennedy Creek. In a recent report on the placer deposits of Libby Creek, Lincoln county, and Kennedy Creek, Missoula county, Mr. F. C. Schrader of the United States Geological Survey says that some mining men estimate the gold in the Kennedy Creek basin at $18,000,000. In a limited area he estimates $5,000,000 for the Kennedy Creek portion of the area examined, and in the basin $11,000,000. The entire district of which Kennedy Creek is a portion is roughly estimated by Mr. Schrader to contain about $100,000,000 worth of gold. Many other districts in this section have great undeveloped mineral wealth.

Lumbering is a very important industry and the lumber mills at Bonner and St. Regis are among the largest in the northwest. Smaller mills are numerous.

There are many acres under irrigation near Missoula and year after year large crops of wheat, oats, clover, timothy, alfalfa and vegetables are raised. Average yields per acre are: Oats from 70 to 100 bushels, wheat from 40 to 60 bushels, timothy 2 to 4 tons, and clover 3 to 5 tons. Potatoes average from 200 to 600 bushels.

The opening to settlement in 1910 of the Flathead Reservation doubled the area of available farm lands. The reservation was quickly settled,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POWELL
IDAHO
RAVALLI
GRANITE
MISSOULA
COEUR D'ALENE
MTS
Ronan
St Ignatius
Ravalli
Flathead
Arlee
Jocko P.O.
Agency
Depot
Evaro
Thomas
Desmet
MISSOULA
Bonner
Potomac
Clinton
Post
Woodman
Lolo Hot Sprs
Lolo
Vc Clain
Carlton
Toole
St Regis
Ashmore
Martina
Superior
Cobden
Quartz
Forest
Rivulet
Stark
Tarkio
Iron Mtn.
Spring Gulch
Forgeville
Drexel
Haugan
Henderson
Alberton
Huson
Frenchtown
Primrose
Johnsrud
Fish Cr
Lolo Pk
Round Mt
Mount Morgan
Craddock Pk
Ward Pk
East Portal
Bitter Root Mountains
SCALE IN MILES
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The Gleason Map Co. Denver, Colo.

and on each claim, as a rule, a part of the land has been broken and planted, but the unbroken area far exceeds the lanl that has been plowed. Every year new lands are brought into cultivation, and when means are provided to ship by railroad the production of crops in this section may be ten times as great as in 1911.

Some remarkable crops have been reported from near Ronan, the principal town. Spring wheat on new breaking ran from 20 to 25 bushels to the acre, winter wheat averaged about 30 bushels, oats yielded 40 to 70 bushels and barley about 50 bushels. Larger yields are reported in several instances. Wm. Connerly had, at one time, 12,000 sacks of wheat piled up at his ranch. Vegetables made surprising growths. Potatoes that weighed over 3 pounds and cabbage over 20 pounds were shown at Ronan. Good crops of hay were cut throughout the reservation.

The towns are Missoula, Bonner, Saltese, St. Regis, Alberton, Dixon, Ravalli and Ronan. Ronan, the chief town in the Flathead reservation, has a population of 500, is about to be incorporated, has a bank, a newspaper, business houses, and is looking forward confidently for the arrival of a railroad that will hasten the development of the fertile region of which it is the trading point. Ravalli and Dixon are growing towns in the reservation; Alberton is a railroad town on the Milwaukee; Saltese is in a mineral and timbered district; St. Regis has a large saw mill, and at Bonner, six miles east of Missoula where the Big Blackfoot river emerges from a canyon, is an electric power plant and one of the largest lumber mills in the northwest.

Missoula county has about 7,500 acres in orchards, and large areas of fruit lands both in the older sections of the county and in the reservation. Apples, pears, plums, cherries and berries are the fruits that are grown in quantities and many opportunities exist to buy orchards or fruit lands at reasonable prices. Missoula is the home of the McIntosh Red apple, the famous fruit that grows to perfection in the Bitter Root, Missoula, Plains and Flathead valleys. Other varieties do equally as well and fruit growing is well established as a very profitable industry. Wonderful displays of the many kinds of fruits that flourish in Montana are made at the Western Montana Apple Show which is held at Missoula. The secretary of the State Board of Horticulture, who is also the chief inspector of fruits and fruit trees, has his office in that city.

Missoula, the metropolis of the western part of Montana, is most conveniently located at the entrance of the Bitter Root valley which extends to the south, has the Missoula valley adjacent, is close to the Flathead reservation on the north, and the Big Blackfoot valley on the east. Missoula is a well built progressive city having all modern improvements, good public, business and private buildings, two daily newspapers, banks with large deposits, electric lights, railroad and power, numerous important business houses and manufacturing establishments and openings for more. It has a U. S. Land office and is the headquarters of the forestry service for the state. Ft. Missoula is in the suberbs. It is called the "Garden City" and is a delightful place of residence.

The Northern Pacific and Milwaukee railroads traverse the county and Missoula is a division point on the former road. The pay-roll of railroad employees is an important factor in the business of the city. The main line of the Northern Pacific, entering the county near Bonner, runs northwest through Clarks Fork valley; a branch line extends to the Couer d'Alenes in Idaho passing through a farming, timbered and mining section; and the Bitter Root branch runs south through the fertile Bitter Root valley. The Milwaukee roads parallels the other road from the eastern boundary to the city and crosses the Bitter Root mountains into Idaho. An electric railway through the Bitter Root valley and another from Missoula to Flathead Lake are transportation facilities that are expected to be supplied in a year or two. Missoula is the seat of the University of Montana, which in the few years since its establishment has grown to be an institution of great usefulness and influence. Missoula has experienced a remarkable growth in a decade. The population in 1900 was 4,366 and 12,869 in 1910, an increase of 195 per cent.

The population of Missoula county in 1900 was 13,964 and 23,596 in 1910, an increase of 69 per cent. Sanders county was taken from Missoula between the two census periods. The assessed valuations of property in 1908 was $12,541,120 and $17,470,449 in 1911, or an increase of 39 per cent.

The vacant and unappropriated public lands were 1,461,710 acres in 1908 and 1,429,247 in 1911.

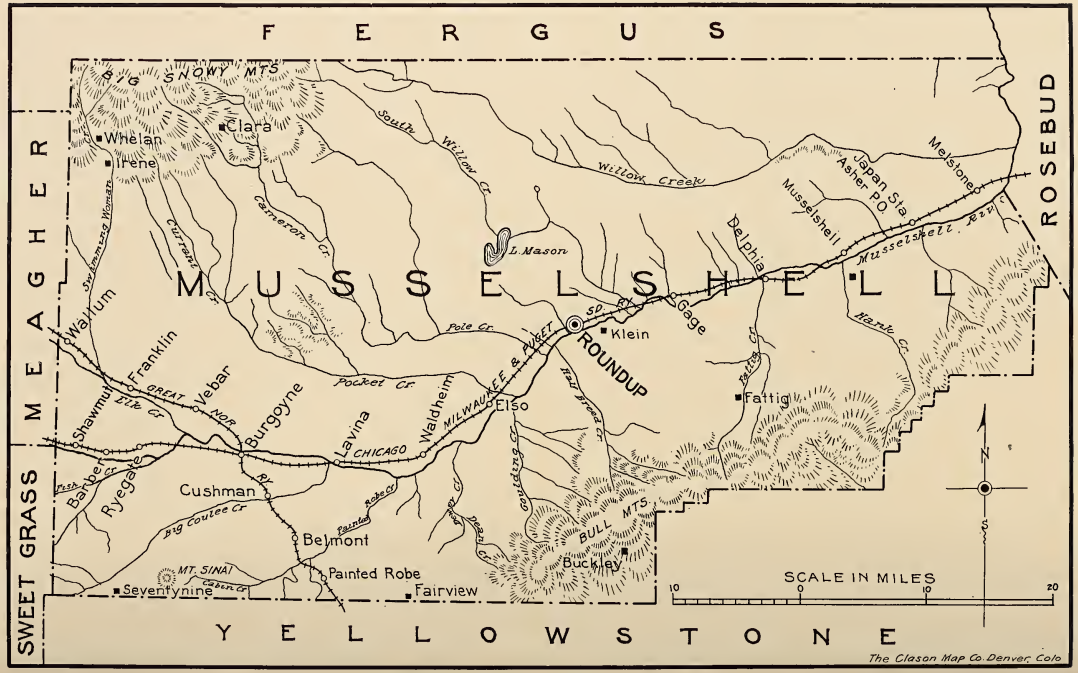
Further information may be had by applying to the secretaries of the Chambers of Commerce at Missoula and Ronan.

MUSSELSHELL COUNTY.

Musselshell county was created February 11, 1911 from parts of Fergus, Yellowstone and Meagher counties. The county is named for the Musselshell river, which flows through the center from west to east, and embraces a large part of the Musselshell valley.

The industries are coal mining, stock raising and farming. Very extensive beds of coal of good grade, long known to exist in the Bull mountains, were idle until the Chicago, Milwaukee and Puget Sound Railway was built through the Musselshell valley. The railroad company needed coal for its operations and large mines were opened up at and near Roundup. The Republic Coal Company is operating at Klein three miles from Roundup. Smaller coal mines are in operation in the district.

For the period between Oct. 31, 1910 and Oct. 31, 1911, the State Coal Mine Inspector reports that 317,986 tons were mined at Klein and an average of 382 men employed. At mine A of the Roundup Coal Company the output was 247,490 tons and 264 men employed on an average. The Davis Coal Company, three miles east of Roundup, worked part of the year, turned out 78,262 tons and employed 153 men. Three miles west of Roundup extensive development work is being done on the mine of the Keene Coal Company which is likely to become a large producer. With a further development and an increased demand for their product the output of the Roundup coal mines has greatly increased. A dispatch to the Ana-


F E R G U S
BIG SNOWY MTS
Clara
Whelan
Irene
South Willow Cr
Willow Creek
Japan Sta
Asher P.O.
Melstone
ROSEBUD
Mussellshell
Mussellshell Arm
Delphia
L. Mason
Cameron Cr
Currant Cr
Sixteenmile Woman
M U S S E L S H E L L
Gage
Klein
Pole Cr
ROUNDUP
Flatwillow Cr
Stark Cr
Fattig
Pocket Cr
Elso
Wallum
Franklin
Shawmut
Vebar
Burgoyne
Lavina
Waldheim
Bitt Cr
GREAT NOR
CHICAGO
MILWAUKEE & PUGET
Rattlesnake Cr
Barber Cr
Ryegate
Cushman
Big Coulee Cr
Painted Robe Cr
Belmont
Painted Robe
Goulding Cr
Peach Cr
BULL MTS
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Seventynine
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Fairview
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The Clason Map Co. Denver, Colo

conda Standard, dated October 29, 1911, stated that on one day mine A of the Roundup Coal Mining Company mined and loaded 1,504 tons and mine No. 2 of the Republic Coal Mining Company 2,043 tons, the combined output for one day being 3,455 tons. On the pay-roll of the Roundup mine were 304 men and 410 miners are employed at mine No. 2. of the Republic Coal Company.

The Musselshell country has long been famous for cattle and sheep. The industry is a leading one and many carloads of horses, cattle, sheep and wool are annually shipped from Roundup, Musselshell, Melstone, Lavina and other stations.

In the narrow valleys are irrigated tracts that produce great crops of hay grain and vegetables. With the coming of the railroad came the development of the farm lands on the benches back from the valleys. A great many new farms have been started and good crops have been raised without irrigation. Seven outfits were busy threshing near Roundup in 1911. "Last year," says the Melstone Graphic "there were only 500 acres under cultivation near Melstone and this year there are 2,500 acrs." In other parts a like development has taken place.

The county comprises 2,300,000 acres, classified as follows: Irrigated lands 41,200 acres; coal and timber lands 670,000 acres; farm lands settled (homesteads etc.) 406,000 acres; farm and grazing land vacant, 270,800 acres; Northern Pacific lands unsold 736,000 acres and state land 118,000 acres.

A circular of the Roundup Commercial Club says:

In general character the country is a series of benches, or level stretches, midway between the valleys of the streams. Southeast are the Bull mountains, and to the northwest are the Snowies; about fifty per cent of the land between is level, the balance being rougher breaks along the watercourses. The heavy soil of the creek bottoms requires more moisture than that of the benches, hence it usually is irrigated. The soil of the benches is a chocolate clay loam from one to four feet in depth, often with a mixture of limestone gravel, and the subsoil is a lighter clay. This land is giving wonderful results in winter wheat. In 1910, perhaps the dryest season in twenty years, winter wheat of the finest quality averaged, in Musselshell county, more than twenty bushels per acre. Thirty to forty bushels is not an unusual yield. Alfalfa is proving a success on the bench land; all grain and root crops, and also fruits, produce great results when properly cultivated. The rougher land will always be used more or less for grazing, although there is hardly a quarter section but has some plow land upon it. The native grass, while short, is rich, and stock winter on it in excellent shape without other feed. The farmer can always find cheap pasture for a number of sheep, cattle or horses, convenient to his farm land.

Free homesteads are still to be had in this promising country, and deeded lands in amounts from 160 acres upward can be purchased at prices which are certain, with the development of the country, to multiply. The greater part of the homestead land is taken(but the country is large and many good sections still remain. This land can be proved up on in five years at no expense, or in fourteen months at from $1.25 to $2.50 an acre. Those who will pay extra for a place in a settled neighborhood can buy relinquishments from the local real estate dealers at prices ranging from a hundred dollars upwards, for a quarter section.

Announcement has recently been made that surveys have been completed of about 350,000 acres of public land situated south of Musselshell and Melstone in the Billings land district which will be subject to home-

stead entry in the near future. The enlarged homestead law applies to a part of these lands. A large area is adapted for farming.

The towns are Melstone, Musselshell, Roundup, Klein, Lavina and Ryegate, all shipping and trading points for rapidly developing neighborhoods. Roundup, called "the Miracle of the Musselshell" has grown in three years from a village in a stock country to a busy, modern, well built and growing town of about 2,000 population. It is the county seat, has city water, electric lights, good schools, churches, fine public and business buildings and dwellings, newspapers, telephones and a monthly pay-roll of about $125,000. About 1,000,000 acres of good farming lands are tributary to the city.

The assessed valuations for 1911, the first year of the county's existence, were $9,054,570.

Further information may be had by applying to the Secretary of the Commercial Club, Roundup.

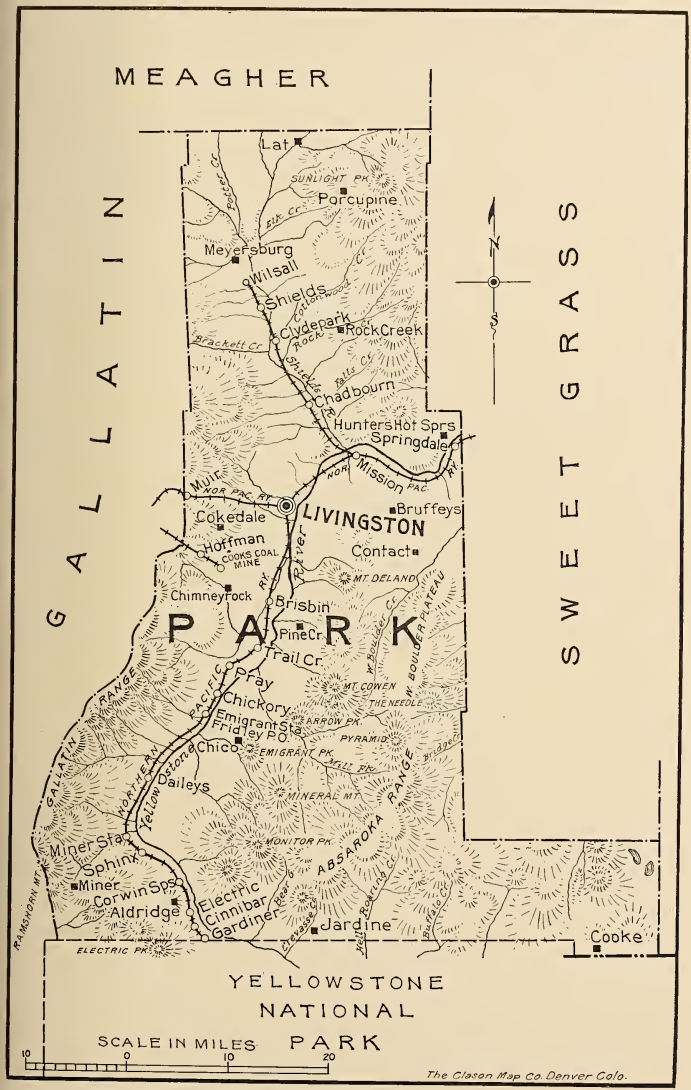
PARK COUNTY.

Park is one of the southern tier of counties and adjoins the Yellowstone National Park. It is watered by the Yellowstone and Shields rivers and their numerous tributaries. On each side of the upper Yellowstone are foothills that rise gradually to high mountain ranges which contain timber, minerals, much beautiful scenery and favorite resorts for hunting and fishing. Hunters, Chico and Corwin Springs attract many health seekers as their waters have valuable curative properties.

The industries are stock raising, farming and mining. The minerals are gold, silver, copper, lead, scheelite and coal. Deposits of cement rock, gypsum and marble have been found. The developed coal mines are at Aldridge in the southern end of the county and in Trail Creek near the Gallatin county line. Mineral districts are at Emigrant Gulch, a former rich placer, Jardine and Crevasse near Gardiner, and Cooke City in the southeastern corner which includes an extensive, highly mineralized district which promises to become one of the most active camps in the country when a railroad is built into it.

Park county has much excellent grazing land on which pasture live stock of excellent grade. At the Montana State Fair of 1911, Senator, a Percheron, foaled May 6, 1908 and weighing 1860 pounds, exhibited by J. McNiven of Livingston, was declared the champion stallion of all draft breeds. The cattle of George J. Allen have won many prizes including the special prize of $550 at the great Chicago Stock Show. There are also sheep of the highest grades.

The agricultural industry which is growing rapidly in importance embraces farming of irrigated lands in the valleys and of unirrigated lands on the benches and in the foothills. The soil is fertile and crop yields challenge comparison with those grown anywhere. Oats, wheat, barley and alfalfa are the chief crops in the irrigated districts and truck farming and fruit growing are also engaged in to a limited extent. All root crops make remarkable yields. On the unirrigated lands wheat, oats and barley are the leading crops.


MEAGHER
GALLATIN
SWEET GRASS
PARK
LIVINGSTON
Lat
SUNLIGHT PK
Porcupine
Meyersburg
Wilsall
Shields
Clydepark
Rock Creek
Brackett Cr
Chadbourn
Hunters Hot Sprs
Springdale
Mission
Mill
Bruffeys
Cokedale
Hoffman
Cooks Coal Mine
Contact
Mt Deland
Chimneyrock
Brisbin
Pine Cr
Trail Cr
Pray
Chickory
Emigrant Sta
Friday P O
Chico
Dailey
Daileys
Mineral Mt
Miner Sta
Sphinx
Miner
Corwin Spgs
Aldridge
Electric
Cinnibar
Gardiner
Jardine
Cooke
Absaroka Range
Monitor Pk
Pyramid
Emigrant Pk
Mt Cowen
The Needle
Arrow Pk
Boulder Plateau
Electric Pk
Yellowstone National Park
Scale in Miles
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The Clason Map Co. Denver Colo.

The Yellowstone valley extends from the National Park to the eastern boundary of the county and is separated by canyons into several districts. South of the canyon near Livingston is one extensive farming district and east of the town is another. The Shields river valley embraces many hundred thousand acres of farm land.

The production per acre of leading crops in 1910 was as follows: Wheat—irrigated, 45 to 60 bushels; unirrigated, 25 to 35 bushels; oats—irrigated, 70 to 90 bushels; unirrigated, 40 to 60 bushels. This was a year of crop failures in many sections but there were no crop failures in Park county. Alfalfa yields from 2 1-2 to 4 tons an acre, timothy and clover from 2 to 3 tons. There is a good demand for the 100,000 tons of hay that is annually cut.

A large acreage of new land was cropped in 1911, average yields were high and some remarkable ones were reported. McClung Bros. received from their wheat crop on 525 acres $14,580 a gross income of $27.54 an acre. Wm. Killorn's oats averaged 78, W. F. Lee's 84 and C. C. Cowman's 72 bushels to the acre. J. B. Mather & Son threshed 180 acres of wheat that yielded 50 bushels per acre and H. J. Haley 150 acres of Turkey Red wheat that averaged 50 bushels per acre. C. A. Arnet planted 367 acres in flax and the yield was from 10 to 12 bushels to the acre. Arthur Bishop threshed 715 bushels of flax from a field of 49 acres, an average of 15 bushels to the acre. P. B. Julian's flax threshed 20 bushels to the acre.

The remarkable development the Shields river valley has undergone is shown by figures compiled by O. J. Wakefield. In 1910 there were about 61,804 acres in grain, 93,667 in 1911, and in 1912, he says, the acreage will be 149,275, an increase of more than 125 per cent in two years. Commenting upon these figures the Clyde Park Herald says:

> At this there is scarcely a tenth of our available farm lands in cultivation, thus showing the tremendous productive possibilities of the valley when it shall become settled up.

Park county exhibits have won many prizes at the State Fair and Expositions. Grass seed and grain for seed are in demand because of the superior quality of the products. The raising of peas for seed houses begun in 1911 and promises to become an extensive and profitable business.

Many apple trees have been set out and the production of fruit for export will soon be an industry that will add to the wealth of the country. Profitable branches of farming are raising hogs, poultry, vegetables and dairy products. Most of these products are sold at good prices either at Livingston, the mining camps, or the Yellowstone National Park, but for any surplus the shipping facilities are good and the markets of Butte and Helena convenient. Park county has been slow to make known its advantages as a farming region, but since the construction of a railroad up Shields river has received a number of new settlers. Raw lands for unirrigated farms sell at from $10 to $30 per acre, improved unirrigated farms at from $20 to $40 per acre, and irrigated lands at from $30 to $60 an acre. The Livingston Post reports that W. A. Brown lately of Florida paid $50 an acre for an unirrigated section south of Elk

Creek. The land has been producing 40 bushels of wheat to the acre, and Mr. Brown says that forty bushel land at $50 an acre, without irrigation, beats buying gold dollars at fifty cents. "I have been used to seeing thirty bushel land sell for one hundred and fifty dollars an acre" said Mr. Brown "and I'd like to buy all the land in this valley at the price that is as good as this."

Most of the 30,000 tourists who annually visit the Yellowstone National Park pass through Livingston and enter at the Gardiner gate. The park traffic creates a home market for many products and in other ways is of great benefit.

The main line of the Northern Pacific railroad traverses the county. From Livingston the Park branch extends south to Gardiner a distance of fifty-four miles, and the Shields river branch north to Wilsall a distance of twenty-eight miles. From the coal mines on Trail Creek a short railroad extends to the main line at Mountainside.

The towns are Livingston, Gardiner and Clyde Park. Gardiner is at the entrance of the Yellowstone National Park and is a busy place during the season. It is also the trading point for a rich mining country, including the Cooke city district access to which is through the park. Clyde Park is a new growing town in the fertile and developing Shields river valley, has a bank, a newspaper, a creamery, and an elevator.

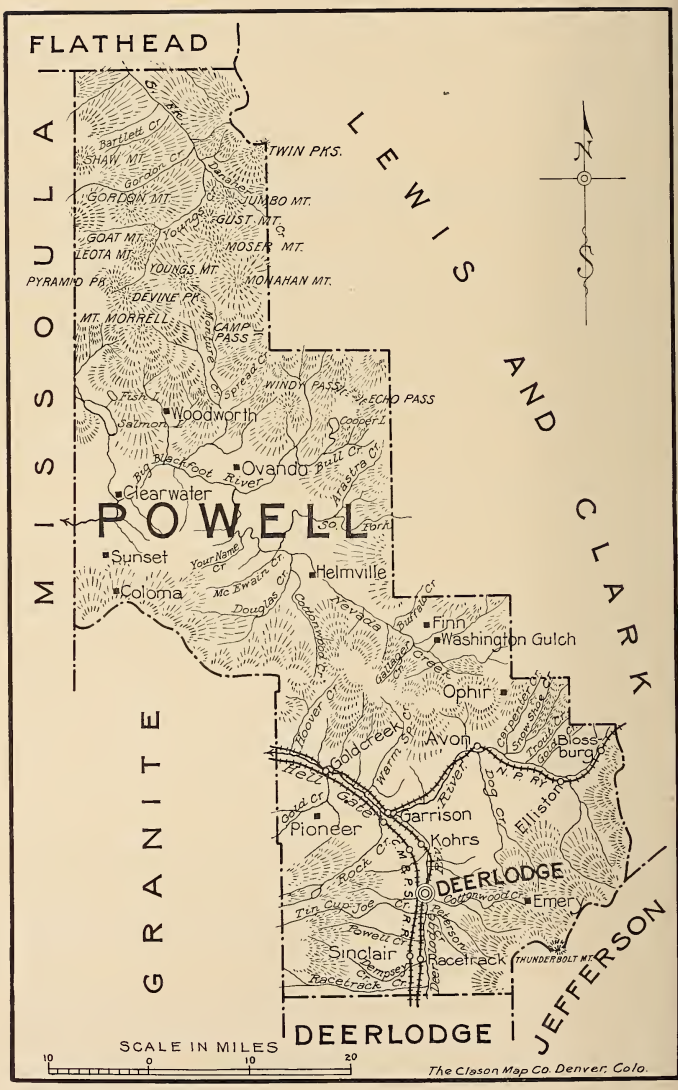
Livingston, the county seat is a thriving little city, whose population increased from 2,778 in 1900 to 5,359 in 1910, a gain of 93 per cent. It is a division point on the Northern Pacific railroad and has the largest machine shops between Brainerd, Minn., and Tacoma, Wash., the monthly pay-roll amounting to $80,000. No town of the United States of like population has, it is believed, a railroad station building as elegant and costly as that of the Northern Pacific at Livingston. Livingston has fine public buildings, excellent schools, parked streets, cement sidewalks, a public library, banks, two daily newspapers, many business houses, and numerous attractive private residences. A federal building to cost $100,000 has been authorized. The town does a large trade with a fertile and developing country and has openings for manufacturing establishments. Only a small part of the great water power of the Yellowstone river is utilized. Livingston is an enterprising, prosperous and growing town.

The vacant and unappropriated public lands were 827,192 acres in 1908 and 121,001 in 1911. The assessed valuation was $6,698,888 in 1908 and $9,015,237 in 1911, an increase of 35 per cent. The population was 7,341 in 1900 and 10,731 in 1910, an increase of 46 per cent.

Further information may be had by applying to the secretaries of the Commercial Clubs at Livingston and Clyde Park.

POWELL COUNTY.

In 1858 Granville Stuart, an honored pioneer who now lives in Butte, and five companions made at Gold Creek in what is now Powell county the discovery of placer gold which, it is claimed, led to the settlement of Montana. Though unable at the time to work the placer they returned


FLATHEAD
MISSOULA
LEWIS AND CLARK
GRANITE
JEFFERSON
DEERLODGE
POWELL
TWIN PKS.
SHAW MT.
GORDON MT.
JUMBO MT.
GUST MT.
GOAT MT.
LEOTA MT.
MOSER MT.
YOUNGS MT.
PYRAMID PK.
DEVINE PK.
MONAHAN MT.
MT. MORRELL
CAMP PASS
WINDY PASS
ECHO PASS
Woodworth
Ovando
Clearwater
Sunset
Coloma
Helmville
Finn
Washington Gulch
Ophir
Avon
Bloss-burg
Garrison
Pioneer
Kohrs
DEERLODGE
Emery
Sinclair
Racetrack
THUNDERBOLT MT.
SCALE IN MILES
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The Closon Map Co. Denver, Colo.

and began work in 1862; the news of their discovery led to the prospecting of other districts, and Bannack and Alder Gulch were discovered. Gold-seekers in large numbers flocked into the country and a territory was created and named Montana.

One of the original counties was Deer Lodge whose territory has been divided into the four counties of Silver Bow, Deer Lodge, Granite and Powell. Within Powell county are much of the best lands the original county contained; and it has retained as county seat Deer Lodge, which was prominent in the history of pioneer days and is one of the oldest, richest and most attractive towns in the state.

The industries are mining, stock-growing and farming. The placers have been worked from early days and much gold has been taken from them. On both sides of Deer Lodge valley are quartz mines and mineral claims. "Some of the best mining opportunities in any district of the state are to be found in the several mining properties in the upper Ophir and Snow Shoe districts," says the State Mine Inspector. Near Helmville and Ovando several gold and copper properties have been developed, and in the neighborhood of Elliston there is much activity in mining. On Dry Cottonwood Creek, 14 miles southeast of Deer Lodge, many sapphires have been mined.

Powell county is well timbered, especially in the northern part, and lumbering is an industry of importance. A large part of the land is mountainous, and where it is not covered by timber is a luxuriant growth of native grasses. Much attention has been paid to improving the breeds of live stock and Powell county is noted for the excellence of its horses cattle and sheep. King Brook, a famous trotting horse whose picture is shown on another page, is owned by W. I. Higgins of Deer Lodge. Many car loads of beef cattle and wool are annually shipped.

The Deer Lodge valley where irrigation is practiced contains many productive farms. A number of large ranches in the vicinity of Deer Lodge have recently changed hands and will be sold in farms of moderate size with the result of adding greatly to the number of farms in the valley. The valley of the Little Blackfoot is not extensive but contains many good farms. Nevada creek valley is larger and in it are raised large crops of hay and grain. The Big Blackfoot valley is a fine stock country which will change in part to a farming district when railroads are built into it. The soil is fertile, all grains do well, and in few sections can such profuse yields of timothy be secured.

The Day-Hanson Company, which bought the Blair ranches comprising 27,000 acres, are going into farming on a large scale; and from about 1,000 acres in winter wheat in 1911 harvested an immense crop. Others are farming on a less extensive scale. In the foothills unirrigated farms are being started. The Deer Lodge Silver State gives an account of the success of J. H. Meyers in farming without irrigation four miles southwest of Deer Lodge. On his homestead Mr. Meyers has several stacks of wheat, a big crop of alfalfa, potatoes and a good orchard.

The location of Powell county close to the cities of Butte, Anaconda,

Missoula and Helena insures convenient markets for all products. Truck gardening, raising poultry and eggs are profitable, and the county has unusual advantages for the dairyman.

The main line of the Northern Pacific, after crossing the main divide, follows the course of the Little Blackfoot river and at Garrison is joined by the line extending from Butte through the Deer Lodge valley. Through the latter valley the Milwaukee railroad runs. At Bonner a logging road, which is believed to be a forerunner of a branch of the Milwaukee, runs up the Big Blackfoot river into Powell county. The northern part of Powell county is expected to be the scene of much activity in railroad building in a year or two. An account of these rumored railroad extensions is given at another place in this book.

When the Milwaukee railroad was built three years ago Deer Lodge was made a division point. Many men are employed in the shops and in the operating department and a large pay-roll is disbursed monthly. The expansion of business and the growth of the town that has taken place in the past three years is in part due to this fact.

Deer Lodge, the county seat, is essentially a city of homes, is beautifully located, has well laid out streets lined with shade trees, has many churches, fine graded schools, the Powell county High School, St. Mary's Academy for girls, and the College of Montana, an old, well equipped and well endowed institution of higher learning. The population in 1910 was 2,570 and 1,257 in 1900. The town has many handsome public and private buildings, banks, a newspaper, and many commercial establishments. About 200 new buildings have recently been erected, and large sums have been spent in public improvements including a new sewer system and several miles of sidewalks. The Montana State Prison is located at Deer Lodge and the furnishing of supplies to the inmates and guards is a considerable item in the town's business.

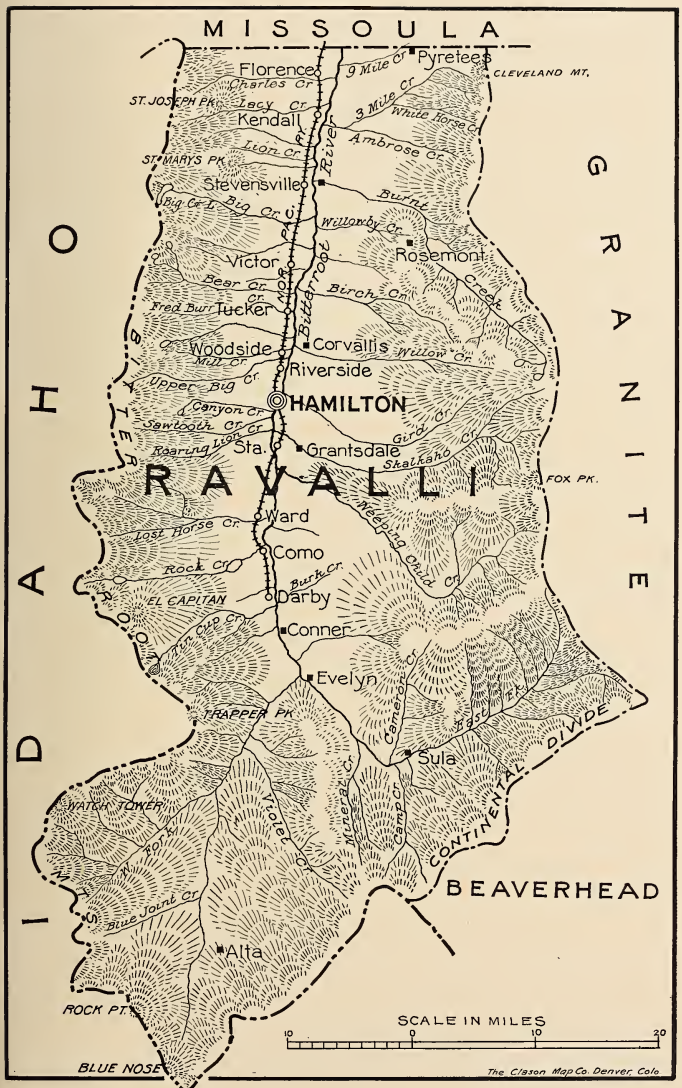
Other towns are Elliston on the Little Blackfoot a mining center, Garrison a railroad junction point and the trading place for a considerable territory, Ovando and Helmville. Helmville is the principal town in the northern part of the county and is surrounded by a good farming region which will experience rapid development when the railroad comes.

The vacant and unappropriated public lands in 1908 were 410,614 acres and 397,457 in 1911. The assessed valuations were $4,153,030 in 1908 and $6,066,999 in 1911, an increase of 46 per cent. The population in 1910 was 7,822.

Further information may be had by applying to the secretary of the Commercial Club at Deer Lodge.

RAVALLI COUNTY.

Ravalli county, located on the western border, embraces all but a small part of the Bitter Root valley which extends south from Missoula seventy-five miles with a width varying from a few hundred yards to ten miles. It is endowed with rare scenic beauty, many streams, soil of great fertility and a delightful climate. Protected by mountain ranges the winters are


MISSOULA
Florence
Charles Cr.
Lacy Cr.
Kendall
Lion Cr.
Stevensville
Big Cr.
Victor
Bear Cr.
Fred Burr
Tucker
Woodside
Mill Cr.
Upper Big Cr.
Canyon Cr.
Sawtooth Cr.
Roaring Lion Cr.
Sta.
Ward
Lost Horse Cr.
Como
Rock Cr.
Burk Cr.
Darby
EL CAPITAN
Conner
Evelyn
TRAPPER PK.
Sula
Violet Cr.
Mineral Cr.
Camp Cr.
CONTINENTAL DIVIDE
BEAVERHEAD
WATCH TOWER
Blue Joint Cr.
Alta
ROCK PT.
BLUE NOSE
Pyrettes
9 Mile Cr.
3 Mile Cr.
White Horse Cr.
Ambrose Cr.
Burnt
Willoby Cr.
Rosemont
Birch Cr.
Creek
Corvallis
Willow Cr.
Riverside
HAMILTON
Gird Cr.
Grantsdale
Skalkaho
Sleeping Child Cr.
FOX PK.
Bitter Root River
Bitterroot
CLEVELAND MT.
ST. JOSEPH PK.
ST. MARYS PK.
IDAHO
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usually mild, the thermometer rarely falling to zero. The summers are delightful; the days are never excessively hot and the nights are always cool.

The Bitter Root valley early attracted settlers; and the extent and variety of the products they raised made it famous. The first settlers were farmers who harvested astonishing crops of hay, wheat and oats. Marcus Daly, the copper magnate, bought a tract of land which he made the most highly improved farm in the state. Some farmers planted fruit trees which succeeded so well that it was evident that the Bitter Root valley possessed unique advantages as a fruit district. Much credit is due to the pioneers whose experiments have built up the fruit industry until it has become the leading one. Orchards are successful on land not suitable for farming, and the profits from growing apples are so great that no one can afford to grow grain on orchard lands. Large capital has been enlisted in developing irrigation and orchard enterprises and much publicity has been given to the attractions and advantages of this section. The Bitter Root Valley Irrigation Company has constructed one of the longest private canals in the world.

Hundreds of thousands of trees have been planted in the last three years. In 1910 it was estimated that there were 33,000 acres in fruit trees in Ravalli county, 11,000 acres in producing fruit trees and 3,500,000 trees set out. About 500 cars of apples were shipped in 1911.

Apples are the chief commercial fruit crop, the variety most extensively grown being the McIntosh Red which reaches perfection in this valley. From 130 trees near Hamilton a profit of $1,750 has been realized. This is an exceptional yield, but a profit of $300 to $500 an acre is not unusual. A fruit buyer visited the apple orchard of Henry Buck near Stevensville last summer and estimated that it would yield 12,000 boxes. Mr. Buck says that he has never received less than $1.75 a box for his apples; and it is thought that when all his crop of 1911 shall have been sold he will have received about $21,000 from his 40 acre orchard. "Large, luscious, brilliant, perfect in form and color, not a worm or a blemish in a hundred thousand boxes, they are the most marketable product on earth," has been said of the Bitter Root apples. Cherries, pears, plums, peaches and berries are also very successful. Fruit tracts are usually irrigated, and water has been brought at great expense from distant reservoirs to insure an unfailing supply. For quality of product and profit yielded the orchards of the Bitter Root valley challenge comparison with those in the most famous fruit districts.

All grains, grasses and vegetables yield large crops. Some years ago John F. Wood of Victor threshed 186 bushels and 25 pounds of oats from 31 pounds of seed supplied by the Farmers Seed Company of Fairbault, Minn. Newspaper reports of crop yields of 1911 were: Oats—Eli Downing, Stevensville, 91 bushels to the acre; W. S. Jones of Victor, 104 bushels, John Hawkins 97, M. G. Kern 107 and John Husted, 115. A. H. Downing threshed 108 bushels of wheat from one and one half acres, and A. S. Groff, 1331 bushels of oats from eleven acres. Other large crops are re-

ported and the average for the valley is very high. From 25 acres at Corvallis John Snell sold $2,000 worth of products, chiefly apples and potatoes. The Ravalli Republican says 6,700 cars of hay were shipped from the county in 1911.

All vegetables thrive. From a 40 acre form in this county John J. Southwick derives an excellent income. An asparagus bed of less than one half acre averages him $5 a day from April 15 to July 1 Two acres of strawberries are then ripe and are followed by currants, cherries, cabbage and celery. A celery bed a trifle larger than an acre has yielded a profit of $1.000. Potatoes, tomatoes, raspberries and pears are other profitable crops. The potato rivals the apple as a profit producing crop and appears on the menus of big eastern hotels as the "Big Bitter Root Potato" and is served on the dining cars of the Northern Pacific railway. Ed. Applebury of Corvalis raised 40,000 pounds of potatoes on two acres of ground and sold the crop for 90 cents a bushel. Hiram Platt of Como gathered 913 pounds of potatoes from a lot 16x55 feet which is equivalent to a yield of 759 bushels per acre.

Ravalli is not a range stock country but has a large number of pure bred horses, cattle and hogs. The Bitter Root Stock Farm was formerly the home of Mr. Daly's stable of famous thoroughbreds and many noted race horses were raised there. The dairy stock is of high grade and the valley has many advantages for the dairy industry. One thousand people were present last August at the opening of the new creamery at Stevensville which succeeds one built in 1908 and whose patrons increased from 22 to 400. Prof Clark of the Agricultural College said that the Stevensville creamery is a benefit not only to the Bitter Root valley but to the whole state because it shows what can and should be done in every county, and continued:

"The people of Montana are consuming annually 7,460,000 pounds of butter and 2,611,000 pounds of cheese. The people of the state manufacture annually only 2,000,0000 pounds of butter and no cheese. This should not be so. We should produce at least all that we consume."

To the industries of fruit growing, farming and dairying, Ravalli county adds lumbering on a large scale. The mill at Hamilton is one of the largest in the state and there are a number of mills of smaller capacity. Ravalli county has also mineral wealth, gold, silver, copper and coal.

The one railroad is the Bitter Root branch of the Northern Pacific which extends from Missoula to Darby, 6[illegible] miles. It is expected that an electric line will be built through the valley from Missoula; and it is hoped that the Butte, Anaconda and Pacific that is about to build to Georgetown Lake will extend its line into the Bitter Root valley and afford direct communication with Anaconda and Butte.

Flourishing small towns are close together, the chief ones being Stevensville, Victor, Corvallis, Darby, and Hamilton, the county seat and principal town. Hamilton has city water works, sewers, electric lights, a fine city hall and county court house, three saw mills, one flour and oatmeal mill, a creamery, an elevator, manufactories and desires a beet sugar factory. It has one of the finest hotel buildings in the state, banks, large

business establishments, good schools, many churches, two newspapers and is the chief trading point of a rich and growing country.

Stevensvile, the next town in population and business importance, has city water works and electric lights, excellent schools, a hospital, six churches, banks, a library, many retail stores, a newspaper, a creamery with an output of about 300,000 pounds of butter, and has openings for a cannery, an evaporator, and a packing house. The first church in Montana was established there by Father DeSmet in 1841; the first wheat, potatoes, and fruit were grown there, and the first flour and saw mills were put up by Father Ravalli in whose honor the county was named.

Victor and Corvallis are flourishing towns in the valley surrounded by good fruit and farming districts. Darby, the terminus of the railroad, 16 miles south of Hamilton, is surrounded by a rapidly developing country. Many new orchards have been set out, and it is expected that 1,660 cars will be required to move the fruit crop when they come into bearing. Besides many cars of sheep and cattle, 120 cars of apples were shipped from Darby in 1911.

All parts of the county present excellent opportunities for the homeseeker to purchase improved or unimproved farms, orchards or fruit lands at prices below their value considered from an investment standpoint, and in many cases on very easy terms.

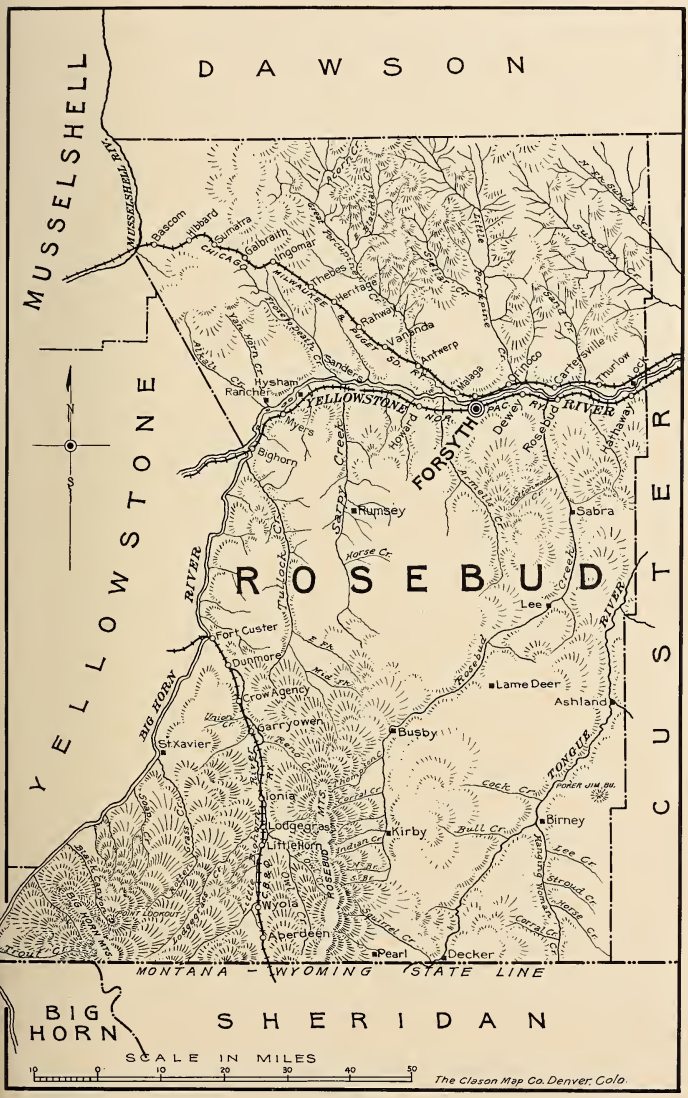
The vacant and unappropriated public land in 1908 was 105,646 acres and 99,011 in 1911, all but 1,357 acres being unsurveyed and described as mountainous, timber, grazing and mineral.

The assessed valuations were $4,760,241 in 1908 and $6,094,102 in 1911, an increase of 28 per cent in three years. The population was 7,882 in 1900 and 11,666 in 1910, an increase of 49 per cent.

Further information may be had by applying to the secretaries of the Commercial Clubs at Hamilton, Stevensville and Darby.

ROSEBUD COUNTY.

Rosebud, a county in the Yellowstone valley, was created in 1901, has an area of 9,510 square miles and is about 128 miles in length from north to south and about 72 miles wide. Though developing very rapidly it is sparsely settled and offers excellent opportunities to homeseekers. Stock growing was almost the only industry when the county was established and continues to be an important and profitable one, but is being supplemented by a large and yearly increasing prduction from farms. Farming is of irrigated lands in the valleys and on the bench lands without irrigation. The Yellowstone river runs through the county and has an extensive valley. Other rivers from which irrigating canals have been taken are the Tongue, the Rosebud, the Little Big Horn which crosses the Crow Indian reservation, and the Big Horn which forms the western boundary. The chief irrigated districts are in the Yellowstone and Rosebud valleys where are produced great yields of alfalfa, sugar beets, wheat, oats, barley, corn and vegetables. In no county in Montana does corn do better, and stalks and ears of surprising size have been exhibited at State Fairs. The produc-


DAWSON
MUSSELSHELL
YELLOWSTONE
CUSTER
ROSEBUD
FORSYTH
BIG HORN
SHERIDAN
MONTANA — WYOMING STATE LINE
YELLOWSTONE RIVER
MUSSELSHELL RIVER
BIG HORN RIVER
TONGUE RIVER
Bascom
Hibbard
Sumatra
Galbraith
Ingomar
Chicago
Milwaukee
Rahway
Varanda
Antwerp
Hysham
Rancher
Sanders
Myers
Bighorn
Rumsey
Sabra
Lee
Fort Custer
Dunmore
Crow Agency
Lame Deer
Ashland
Busby
Garryowen
St Xavier
Ionia
Lodgegrass
Kirby
Birney
Little Horn
Wyola
Aberdeen
Pearl
Decker
Carter
Thurlow
Hathaway
Rosebud
Horse Cr.
Tullock
Rosebud Creek
Tongue River
Pumpkin Creek
Otter Creek
Hanging Woman Creek
Lee Cr.
Stroud Cr.
Horse Cr.
Coal Cr.
Bull Cr.
Indian Cr.
Wolf Cr.
Prairie Dog Cr.
Pine Cr.
Rosebud Mts.
Wolf Mts.
Pumpkin Cr.
Hanging Woman Cr.
Big Horn Mts.
Pryor Mts.
Pryor Cr.
Big Horn Cr.
Soap Cr.
Sarpy Creek
Howard Cr.
Deer Cr.
Rosebud Cr.
Armells Creek
Yellowstone R.
Custer Cr.
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Valley Cr.
Big Horn Cr.
Soap Cr.
Pryor Cr.
Pryor Mts.
Big Horn Mts.
Wolf Mts.
Rosebud Mts.
Pumpkin Cr.
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Tongue River
Pumpkin Creek
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Lee Cr.
Stroud Cr.
Horse Cr.
Coal Cr.
Bull Cr.
Indian Cr.
Wolf Cr.
Prairie Dog Cr.
Pine Cr.
Rosebud Mts.
Wolf Mts.
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Big Horn Mts.
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Sarpy Creek
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10 0 10 20 30 40 50
The Clason Map Co. Denver, Colo.

tiveness of the soil is strikingly shown by the great yields of vegetables and by the size of specimens. Yields on irrigated farms are about as follows: Wheat, 50 to 60 bushels; oats, 70 to 90 bushels; sugar beets, 18 to 22 tons; alfalfa hay—three cuttings—2 to 6 tons an acre.

A number of large irrigating canals have been constructed in the Yellowstone valley and others are planned. Very fertile lands, near railroad lines and with ample water rights, may be purchased at about $50 an acre.

Away from the valleys farming is being successfully carried on without irrigation, and it is on lands of this kind that most of the new settlers have made their homes. The dry farm experiment station situated six miles from Forsyth has demonstrated the great yields that the bench lands of Rosebud county will make when properly cultivated. Tables of yields at all stations are printed at another place and are referred to: Yields of 16.09 bushels of flax, 29.83 bushels of spring wheat, 58.17 bushels of fall wheat, 40.17 bushels of corn and 281.57 bushels of potatoes grown without irrigation settle all questions as to the suitability for farming of the great areas of prairie and bench lands of Rosebud county. The raising of fruits on a commercial scale is a new business but gives promise of developing into an important industry.

Part of the Crow Indian reservation, including the agency, is in this county. The Cheyenne Indian Reservation about 30 miles square area, is in the southern part of the county. The Indians do some forming, raise much live stock, and annually hold an industrial and agricultural fair that is creditable to them and very interesting to visitors.

Rosebud county is immense in extent having an area of 9,510 square miles. In 1910 the population was 7,985, one-third living in towns. The vacant and unappropriated public lands were 3,203,703 acres in 1908 and 1,980,763 in 1911. In three years 1,212,940 acres were filed on, a remarkable record.

The advance in the value of property shows in a striking manner how Rosebud county has developed. In 1901 when the county was created the value of all property was $2,853,220; in 1911 it was $10,990,110, an increase in ten years of 285 per cent. In the three years between 1908 and 1911 the increase was 69 per cent.

The county is in an early stage of development and little publicity has been given to its many advantages. Rosebud county has room and land for ten times its present population.

The Burlington railroad runs through the Crow reservation. The Northern Pacific Railroad crosses the county in the Yellowstone valley. From the eastern border to Forsyth the Milwaukee runs along the north bank of the Yellowstone and then turns northwest into the Musselshell country. The principal towns and older farming districts are in the Yellowstone valley; and along the line of the Milwaukee are many new towns which are trading places for the new farming communities that have sprung up near them.

The principal town is Forsyth, the county seat, which is located on both railroads, and in population and business is the most important town in

the large extent of country between Billings and Miles City. Forsyth is a progressive place, has good schools, several churches, a public reading room and gymnasium, municipally owned water works, a sewer system, cement side walks, electric lights, telephones, a newspaper, banks, hotels, business houses and attractive residences. The railroads employ a considerable number of men, and from Forsyth are shipped large quantities of wool and live stock. It is the trading point for an extensive and developing agricultural section.

Other towns on the Northern Pacific railroad are Rosebud, which is a thriving town and trading point for a large territory on both siles of the Yellowstone river and for the country drained by the Rosebud river, and Hysham in the western part of the county which is surrounded by a very productive country and is a progressive and growing town.

The towns on the Milwaukee are all young, but have made substantial growths in the past three years. Cartersville is in an irrigated section that produces wonderful crops and has a trade which extends to the unirrigated districts north and south of it. Mnay new settlers have come into this part of the county, and Bascom, Sumatra, and Ingomar are among the promising towns. Much live stock is shipped from stations along this line and from them depart homeseekers who are filling up the country to the north.

In 1900 Rosebud was a part of Custer county; its population was enumerated separately in 1910 for the first time and was found to be 7,985.

Further information may be had by applying to the secretary of the Commercial Club at Forsyth.

SANDERS COUNTY.

Sanders county was created from a part of Missoula in 1906 with a population of about 3,000 and an assessed valuation of $2,250,000. In 1910 the population was 3,713 and has since much increased. The assessed valuation in 1911 was $4,816,308 an increase of 114 per cent. The increase since 1908 was $924,544 or 24 per cent.

The county which lies on the western boundary of the state has an area of 2,803 square miles or about 2,000,000 acres, of which 500,000 are agricultural and 1,500,000 grazing, timbered and mountainous. The chief agricultural districts are in the Clarks Fork valley near the towns of Plains, Paradise, and Thompson Falls. Back from the valley on the benches on both sides are farms and fruit tracts. In the Little Bitter Root and Flathead valleys and on Camas Prairie, in the recently ceded Flathead reservation, great agricultural development has taken place in a year and this fertile section will produce great quantities of grain when a railroad is built into it.

Sanders county has a fertile soil, and any crop that grows anywhere in the state makes large yields. The rainfall about 16 inches annually, most of which falls during the growing season, as a rule provides sufficient moisture for crops, although Clarks Fork river and its tributaries provide an abundant water supply for irrigating purposes. The area now under

LINCOLN
FLATHEAD
SANDERS
MISSOULA
IDAHO
Belknap
THOMPSON
Camas
Camas Prairie
Greenspring
Quinn
Plains
Paradise
White Pine
Noxon
Smeads
Trout Creek
Vermilion
Beaver
Thompson
Flathead
Dixon
Perma
Bitter Root River
Clark's Fork
Northern Pacific Ry.
Coeur d'Alene Mts.
Cabinet Mts.
Bull River
Prospect
Missoula
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irrigation is being increased, and excellent opportunities exist for capitalists to undertake large irrigation projects. To its fertile soil, Sanders county adds the advantages of a mild climate and a low altitude, the elevation at Heron being only 2,256 feet. The mountains surrounding the valleys afford protection; and because the springs come earlier and the summers last longer than in other parts, varieties of fruits and vegetables thrive that do not succeed elsewhere.

The soil in the bottom lands is usually a fine, deep, sandy loam, while on the bench lands a rich gravelly loam is found. Common yields per acre are from 2 to 4 tons timothy, 4 to 5 of red clover and 3 to 6 of alfalfa: 40 to 50 bushels of wheat, 60 to 100 bushels of oats, 60 to 70 bushels of barley, 600 bushels of potatoes, and vegetables and fruits in proportion. No finer strawberries are grown anywhere, and they find a ready sale in the mining camps at $3.70 per crate. The agricultural products are sold in all the large cities of the state, but the principal market is in the mining camps of the Coeur d'Alene country, lying immediately south, with which there is a direct railroad connection by way of the Paradise-St. Regis cut-off. The prices obtained range from 80 cents to $1 for wheat per bushel, from $1.25 to $1.50 per hundred for oats or barley, from $10 to $25 per ton for hay, from $1 to $2 per hundred for potatoes, from 2 to 2 1-2 cents per pound for onions, and from $1 to $1.75 per box for apples.

The conditions of fruit growing are substantially similar to those in the Bitter Root and Missoula valleys; the Northern Spy, the Baldwin, and the Spitzenberg apple grow to perfaction; and no finer specimens of the famous McIntosh Red can be found anywhere than are produced in the Plains valley. All other kinds of fruit grow in profusion in all the valleys of the county, and each succeeding year sees new orchards started. Sanders county promises to become one of the chief fruit producing counties of the Northwest.

Excellent yields of crops in 1911 are reported. Charles Hammons of Plains valley threshed 43 1-2 bushels of wheat per acre. Oats and hay made great yields. Hans Nelson dug 7,000 pounds of potatoes, an average of 650 bushels to the acre, says the Sanders County Signal which claims the potato championship of Montana for Joseph Margeau who brought to the editor five potatoes that weighed fifteen pounds. The Sanders county display at the State Fair always arouses admiration. No county exceeds it in variety of products which, beside grains, grasses, dairy products and apples of many varieties, includes grapes, peaches, quinces, pears, plums and vegetables of many kinds.

The mountains which cover about three-fourths of the area of the county, are covered with billions of feet of pine, fir, spruce, tamarack and cedar, and lumbering has been a leading industry since the Northern Pacific Railway was built through it in 1883. Much of the timbered land, when cleared, will make the finest kind of farming land.

Sanders county adjoins the famous Coeur d'Alene mineral district and has a similar geological formation. Around Trout Creek and White Pine sufficient work has been done to show the existence of rich deposits of lead,

silver and copper, and throughout the mountain districts are mineral claims that promise to develop into mines. The mineral districts of Sanders county need capital for their development and promise splendid returns for investments in mining properties.

A valuable asset is the great water power in Clarks Fork river and tributary streams. By constructing a 25 foot dam above Thompson Falls it will be possible to generate 60,000 horse power. Clarks Fork river is a large and swift stream, and the development of the county has been delayed by the lack of bridges across it. During the last two years large sums have been spent in improving highways and in constructing at Plains and Thompson very long and expensive bridges which have opened up communication with farming and fruit districts near those towns.

It is said that in the vicinity of Thompson are 60,000 acres of good fruit land; and an irrigation project to cost $300,000 is in process of construction to bring water on a part of these lands, and the plan is to divide the holdings of the company into tracts of from 10 to 60 acres and to sell them as fruit tracts. Fruits thrive in this vicinity, and it is expected that the completion of this project will lead to the coming of many settlers into the district and to the planting of a large acreage of orchards. At Plains, also, fruit lands have been placed on sale in small lots. Opportunities are numerous to buy farms, orchards or fruit lands at low prices.

The Camas Hot Springs on the Flathead Reservation, have been reserved by the government, have wonderful curative qualities, and may rival as a resort for invalids the Hot Springs of Arkansas. Near Paradise are Quinn's Hot Springs, a favorite place of resort having good accomadations.

Plains, in the productive Plains valley and the trading point for the western part of the Flathead Reservation, is the chief town. It has a water works system, electric lights, an elevator, a public school building which cost $25,000, four churches, banks, newspaper, numerous business houses which have spent much money on permanent improvements and many new buildings have been recently erected.

Thompson Falls, the county seat, a growing town in a rich, undeveloped district, has two public schools and a high school, a hospital, a church, a newspaper, a bank, hotels, stores, and a fine system of water works.

Paradise is a railroad point where are a large railroad roundhouse and a tie preserving plant. A large sum is paid to the numerous railroad employes. Camas is a new town in the Reservation that has grown up around the springs and promises to become an important place. The springs attract visitors to the town which is a trading point for a country that has recently been settled. It has hotels, business houses, a bank and a newspaper.

The unappropriated and unreserved public lands (not including the ceded Flathead lands which are disposed of under a special act) were 63,024 acres in 1908 and 37,152 in 1911.

Further information may be had by applying to the secretaries of the Commercial Clubs at Plains, Thompson and Camas.

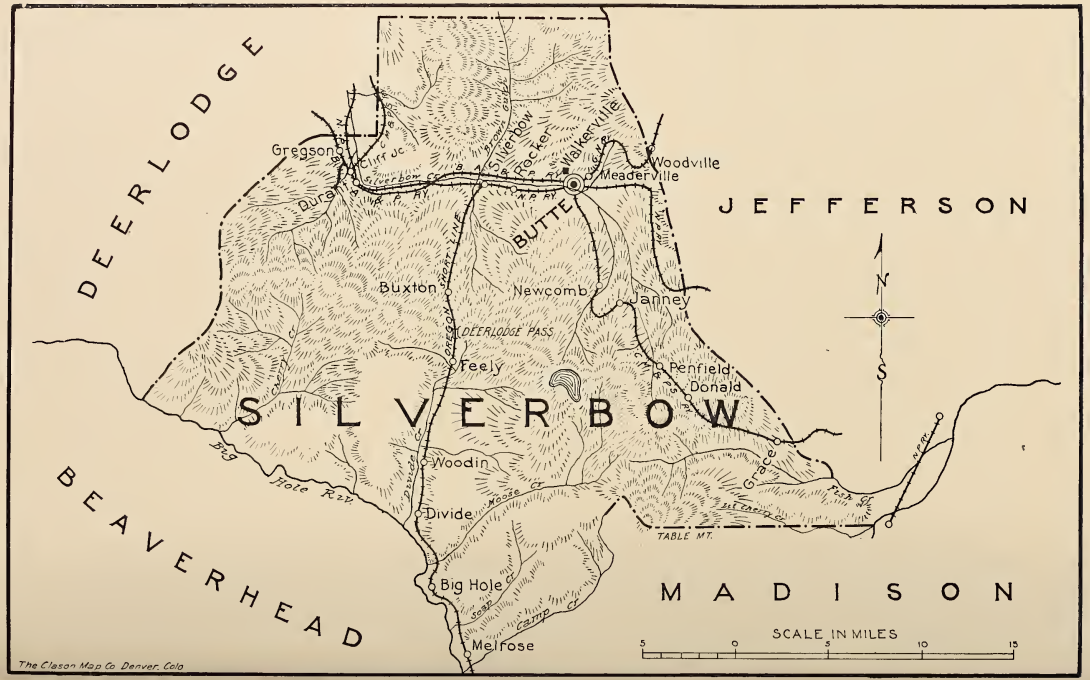
SILVER BOW COUNTY.

Silver Bow, the richest and most populous county of Montana is also the smallest having an area of only 709 square miles. The population in 1900 was 47,635, and 56,818 in 1910, an increase of 23 per cent. The assessed valuations were $32,930,553 in 1908 and $36,705,161 in 1911, an increase in three years of 11 per cent. The mines, which have a value estimated to approximate $500,000,000, are not included in the valuations. The population is nearly all in the city of Butte and in contiguous suburbs that practically, but not legally, are parts of the city. Centerville has a population of 2,500, Walkerville of 2,431, and at Meaderville are 1,838 persons. Butte had a population of 30,470 in 1900 and of 39,065 in 1910, an increase in the decade of 28 per cent.

The county derives its importance and prosperity from the wonderful copper mines of Butte which are worked on an enormous scale. There are dairies and vegetable gardens, but the area devoted to farming is small and no considerable increase in the quantity of land under cultivation is expected.

All the copper that has been produced in Montana has come from the mines of Butte except a relatively small amount. A great part of the silver and gold has also been produced there as by-products of copper mining. The zinc production of the state is also from Butte ores. In view of these facts some idea of the enormous wealth that the mines of Butte have produced and are yearly turning out may be formed by considering the table of the production of minerals in Montana which is printed on page 153. The Butte mining district is the most productive area of its size in the world, and the mining, handling, and treating of ores are conducted by the most modern methods. In no mining district is labor better paid. The miners in the Butte district receive in wages about $1,250,000 a month ;and, in addition, the mines support an army of smeltermen, railroadmen, mechanics and others. The combined pay rolls make Butte the greatest wage-receiving city of its population in the world.

New mineral ground is opened up every year and the old mines show no signs of exhaustion. The output has varied owing to market conditions, the production ranging from 275,000,000 to 312,000,000 pounds in the last three years, but is usually large enough to put Montana in the first place in copper production, and added to silver mined elsewhere in the state, first in the production of silver. Butte's mineral output approximates 30 per cent of the copper mined in the United States, 25 per cent of the copper produced in North America, 17 per cent of the copper production of the world. More silver is mined than any other district in America. The mines consume annually about 65,000,000 feet of timber, 225,000 stulls, and contain one billion feet of timber. They use 4,000,000 pounds of giant powder every twelve months. The underground workings of the mines aggregate over 900 miles. The deepest shaft is 2,900 feet. There is sufficient ore blocked out to run many of the great mines at their present


DEERLODGE
JEFFERSON
BEAVERHEAD
MADISON
BUTTE
SILVERBOW
Gregson
Rocker
Walkerville
Woodville
Meaderville
Buxton
Newcomb
Janney
DEERLODGE PASS
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Penfield
Donald
Woodin
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Melrose
TABLE MT.
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The Clason Map Co. Denver, Colo.

capacity for many years without further development, but vast sums are spent annually in sinking, prospecting and other work, and constant improvements are being made to secure greater efficiency in operations.

Of the work done in 1911, the State Mine Inspector says in his report:

In no year in the history of the Butte district has so much work in the nature of development been done as during the past 12 months. A vast territory to the north of the copper zone has been explored and has proven to carry extensive ore bodies in copper, silver, gold and a large percentage of zinc. The development exceeded by 50 per cent even the large amount of work that was done some four or five years ago during the height of the copper boom, when a score of new companies were engaged in the work of developing new mines. At that time less work of this character was done by the large companies. The past year the small and numerous new companies were entirely out of it, with the exception of a few, and the work was confined to the large companies, which are doing extensive development on the several properties controlled by them. A great change has taken place in Silver Bow county by electricity taking the place of steam, which will in the future add to the life of the camp at least 20 years, by cheapening the cost of production by which low grade ores are being mined at a profit, which otherwise would remain untouched at the present system of mining. While it is impossible for even an estimate of a reliable character to be given of the cost of production until after electricity has entirely taken the place of steam, it has been estimated that there will be a reduction in the cost of production of one cent per pound of copper produced.

The report made Nov. 30, 1911, by the deputy state mine inspector states that the mines of Butte gave employment to 13,343 persons as follows: The Anaconda Copper Mining Company employs 7,435 miners, 1,580 surface men and 2,000 in miscellaneous work; the North Butte 800 miners and 117 surface men; the East Butte 375 miners and 100 surface men; the Butte and Superior 200 miners and 50 surface men; and all others a total of 505 miners and 181 surface mne.

Experiments made during the year in treating by new methods the zinc ores that exist in great quantities have met with a measure of success that encourages the belief that the production of zinc in Montana is likely to reach large proportions within a few years.

Although a considerable quantity of copper ore is treated at the Pittsmont smelter of the East Butte Company by far the greater part of the ores mined in Butte are smelted at Anaconda and Great Falls. In 1911 the Anaconda Company completed the building in Butte of the Washoe Sampling Works one of the largest and most perfectly equipped structures of its kind in the world. The main portion of the plant is 100 feet long, 60 feet wide and 80 feet in height. It has four floors, beside the pit, and has a capacity for handling 500 tons of ore every eight hours.

Butte which has been known as "the Greatest Mining Camp on Earth" is much more than that; it is the most populous city in the northwest in the great extent of country that lies between Minneapolis and Spokane; and apart from its unequalled mining interests is an important financial, railroad, commercial and distributing center. Years ago it emerged from the mining camp stage of existence and is a modern, progressive, permanent, well built, growing city that is, nevertheless, a strong rugged, unique town different from any other place in the world.

The price of copper metal and shares of copper mining companies vary

from month to month, but the Butte mines go on producing. The chief difference is in the size of the dividends distributed; the pay-roll is always working; and "Butte" it has been said, "eats as regularly and as often one year as another. It is a town where money circulates."

Butte is a railroad center. Transportation facilities are provided by the Northern Pacific Railroad, which has branches connecting with the mining districts of Madison county; the Chicago, Milwaukee and Puget Sound Railroad, the Great Northern, the Oregon Short Line and the Butte, Anaconda and Pacific. Butte is the terminus of the two last named roads and of the Montana Central division of the Great Northern which extends by way of Helena and Great Falls to Havre. A survey has been made for an electric railway to Helena, a direct line to the Bitter Root valley is talked of, and a company to build a line from Butte to Boise has been incorporated. No other city in the world of like population shows such a railroad tonnage. Tables compiled three years ago showed that 16,000 cars of freight either originate in or are received in Butte each month, more than 1,000 cars containing merchandise. Over steam roads Butte handles annually about 17,280,000,000 tons of freight, most of it ore, enough to make 5,485 trains of 35 cars each. For every hour of every day, through every week of the month and every month of the year Butte pays more than $1,000 to railroads for freight, or $24,000 daily or $9,000,000 annually.

Butte is an important distributing point for a large part of Montana and Idaho, and has manufactures of many kinds "from macaroni to mattresses, from candy to coffins and an infinite variety between."

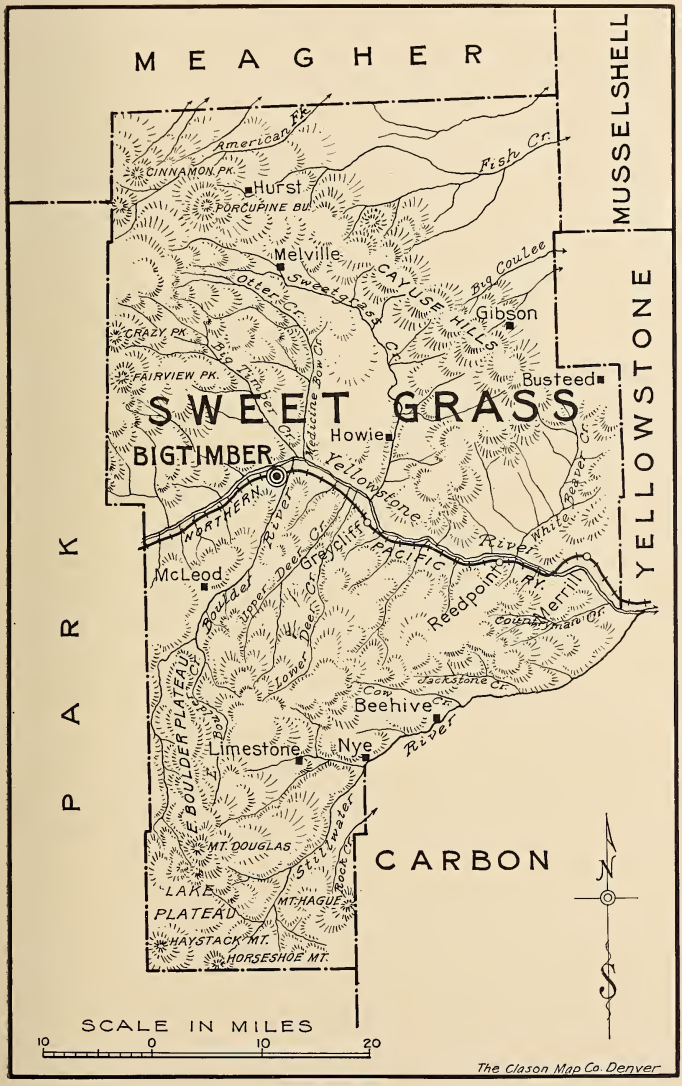
Butte has many strong financial institutions; and business blocks, commercial establishments, newspapers, public schools, parochial schools, and churches, that rival those to be found in cities many times larger. It is the seat of the State School of Mines, has a fine federal building, and the county of Silver Bow has recently completed at the cost of a million dollars one of the best county buildings in the United States. Columbia Gardens is a beautiful place of resort and pleasure ground. Butte is an agreeable place of residence and has many handsome private dwellings.

Butte is a city of consumers whose needs make a local market for much of the vegetables, beef, mutton, poultry, eggs, butter, fruit and flour that Montana produces and great quantities of hay and grain are sold there for horse-feed. Butte is unique and offers many attractive points of interest to the tourist. It is a place where many fortunes have been made and where others may yet be made.

For further information, application should be made to the secretary of the Business Men's Association, Butte.

SWEET GRASS COUNTY.

The Yellowstone river runs nearly through the center of Sweet Grass county. On the south the land rises from the river to a high range of mountains, and on the north to the range which forms the divide between the Yellowstone and the Musselshell. In the southern part, much of which is in a forest reserve, are tracts of merchantable timber and a highly min-


MEAGHER
MUSSELSHELL
YELLOWSTONE
PARK
CARBON
SWEET GRASS
BIGTIMBER
Hurst
Melville
Gibson
Busteed
Howie
McLeod
Beehive
Limestone
Nye
Merrill
Reedpoint
American Fk.
Fish Cr.
CINNAMON PK.
PORCUPINE BU.
Otter Cr.
Sweetgrass Cr.
CAYUSE HILLS
Big Coulee
CRAZY PK.
FAIRVIEW PK.
Big Timber Cr.
Yellowstone River
NORTHERN PACIFIC RY.
Upper Deer Cr.
Lower Deer Cr.
Boulder River
Greycliff
Jackstone Cr.
Stillwater River
BOULDER PLATEAU
MT. DOUGLAS
LAKE PLATEAU
MT. HAGUE
HAYSTACK MT.
HORSESHOE MT.
SCALE IN MILES
10 0 10 20
The Clason Map Co. Denver

eralized district containing ores of gold, silver, lead and copper. Coal has also been found. This region is one of remarkable scenic beauty. Many visitors come each year to fish in the Boulder river, a beautiful mountain stream in which trout abound. One of the most wonderful natural objects in the state is the Natural Bridge over the Boulder river. On several streams are cascades of rare beauty.

The county is well watered and there are many valleys. The Yellowstone valley, about 55 miles long by 2 wide, the valleys of the Boulder, Big Timber, Sweet Grass, American Fork and Otter Creek, of varying length and width, are the chief agricultural districts. Private irrigation ditches have brought water to the lands in the valleys where hay is the chief crop and is raised in connection with stock growing. The county is noted for the excellence of the native grasses and stock growing is an important and profitable industry. Sheep are owned in large numbers and great quantities of wool are shipped from Big Timber.

Farming is of irrigated and unirrigated land, the latter a recent development. Many acres are under private irrigation ditches, and a great impulse has been given to the agricultural development of the county by the completion of the Big Timber Carey Act project which is described on another page. Many new settlers on these lands raised excellent crops in 1911, more land will be cultivated next year; and a large and prosperous community of farmers and fruit growers will occupy many acres that a few years ago were used only for grazing. Oats 162 bushels to the acre, barley showing a cash return of $48 an acre, wheat from 20 to 40 bushels, flax running to 25 bushels an acre, and potatoes remarkable for size and quality are reported as having been raised on lands in this project in 1911. Alfalfa is the chief crop on irrigated lands and yields about four tons per acre. P. A. Bruffy of McLeod harvested 59 bushels of wheat and 70 bushels of oats to the acre. On the farm of J. H. Amerman, near Big Timber, wheat yielded 50 bushels to the acre, and Andrew Forsyth of Grey Cliff threshed 691 bushels of wheat from 12 acres, and his oats averaged 94 bushels to the acre. C. O. Hathaway's field of 15 acres of blue stem wheat yielded 675 bushels.

The county has won many prizes for farm products. At the Dry Farming Congress of 1911 John Forster of Grey Cliff won two gold medals, two silver medals, two first premiums, two second premiums and six third premiums for different kinds of grain in strong competition with exhibits from Canada and from various states.

Farming without irrigation is a new development, but crops of wheat as high as 27 bushels to the acre are reported. Many orchards have been set out and the county promises to become a large producer of fruit. The soil and climate are well adapted for the growth of sugar beets. Mr. G. B. Pope of Big Timber, in a letter to the Big Timber Commercial Club says:

"Sugar beets and sugar beet tops and plup all make fat, either beef, mutton or pork, very rapidly—more rapidly and much cheaper than corn or any other feed that we have at the present time. In conversation yesterday with a field man for the beet sugar factory at Billings, a man who has had years of experience in Colorado and other sugar beet states, he informed me, that actual experiments show that five

acres of sugar beets have a feeding value of 30 acres of corn; also that the feed value of one ton of beets, with beef and mutton at the present prices, is worth $12. This seems rather large to the writer, but cut it in two and then the stockmen and ranchers of the Yellowstone valley can make beef and mutton cheaper than can be done in any of the corn states, or any other place that I know of. Besides we have the best market for such stuff, being situated midway between the eastern and western markets, with the great home demand at hand. While beets pay large profits when raised for sugar, I know they will pay much larger profits when raised for feeding hogs, sheep and cattle which do extremely well on them and fatten rapidly. On good soil, properly handled, they yield from 15 to 20 tons per acre, and the total cost per acre from seed time to money in bank is $35; then the tops are left, which are worth and will sell for $3 per acre. There are net profits of $50 to $75 per acre, depending upon the yield. What business pays better than this?"

Hog raising is attracting attention and the conditions are favorable for its development into a very profitable branch of farming. The excellence of the grasses, water and climate suggest that dairying ought to become one of the leading industries.

Small towns that are trading points for the surrounding country are Melville in the northern and McLeod in the southern part of the county. Big Timber, the county seat, is the chief town. It is an attractive and growing place and has an elevator, a creamery, a newspaper, hotels, stores, schools, churches, a hospital, a city hall, miles of cement sidewalk, electric lights, a water works system, an attractive court house, and is the trading and shipping point for a rich agricultural and stock country. Of 26,000 horse power available only 60 horse power is developed.

The vacant and unappropriated public lands were 652,510 acres in 1908 and 391,869 in 1911. The population in 1900 was 3,086 and 4,029 in 1910, an increase of 31 per cent. Assessed valuations in 1908 were $4,704,182 and $5,759,818 in 1911, an increase of 24 per cent in three years.

Further information may be had by applying to the secretary of the Commercial Club at Big Timber.

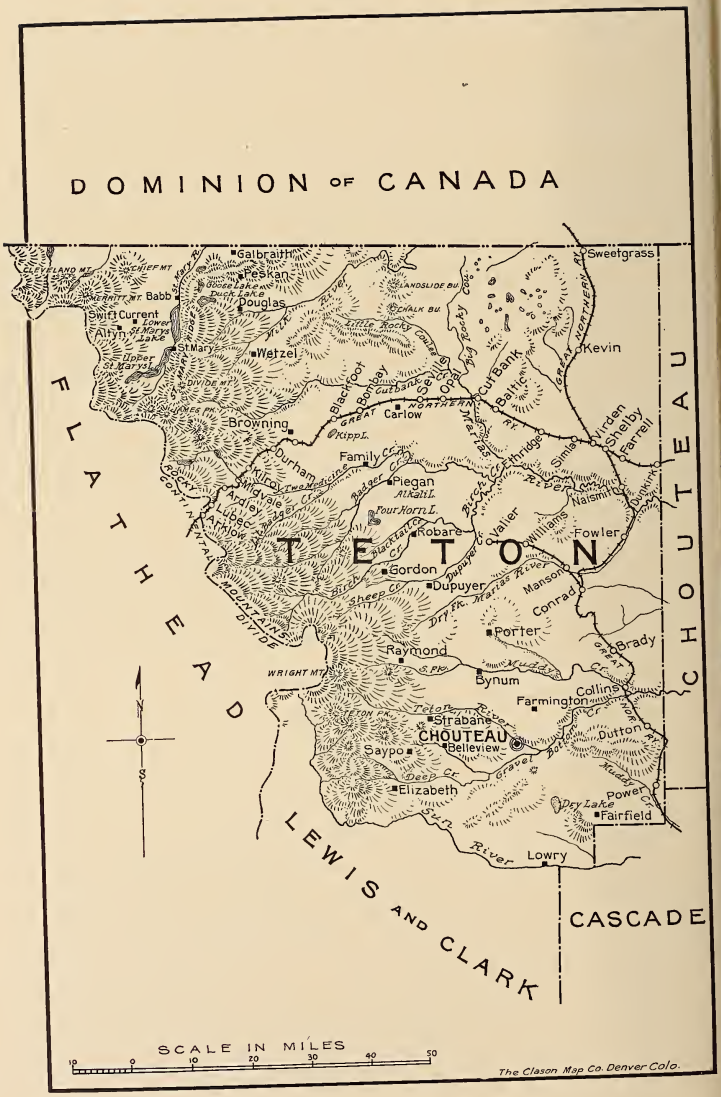
TETON COUNTY.

Teton is one of the very large counties south of the Canadian boundary line in which owing to its great size, considerable differences in altitude, climate and soil are found. It embraces a part of the Rocky Mountains and the winter climate is somewhat severe at times. The cold, however, rarely lasts long because of the prevalence of chinook winds and is seldom severe enough to interfere with outdoor work.

The Blackfeet Indian Reservation occupies the northwest corner.

Teton county has farm lands estimated to amount to 3,000,000 acres, only a small part of which is in cultivation. Some parts are well watered with creeks and springs, but on the greater area the farmer must depend upon wells. Water is found in wells at depths varying from 8 to 100 feet.

The livestock industry is still the leading one; but the farming resources are being rapidly developed. The Burton bench is a large farming district where wheat yields average 40 bushels an acre and oats 85 bushels. There is no record of heavier oats than those grown on this bench; a bushel has weighed 55 pounds; and the lightest of 83 samples sent to the


DOMINION OF CANADA
FLATHEAD
LEWIS AND CLARK
TETON
CHOUTEAU
CASCADE
Galbraith
Pendan
Babb
Swift Current
Lower St Mary Lake
Upper St Mary Lake
St Mary
Wetzel
Douglas
Landslide Bu
Chalk Bu
Little Rocky Creek
Sweetgrass
Kevin
Cut Bank
Great Northern Ry
Blackfoot
Bonley
Gubser
Gas
Oil
Carlow
Northern Pac Ry
Baltic
Virden
Shelby
Farrell
Browning
Kipp L
Durham
Family Cr
Kiowa
Piegan
Alkali L
Badger Cr
Birch Cr
Four Horn L
Ardley
Lubec
Arlee
Robare
Valier
Williams
Fowler
Naismith
Dunkirk
Gordon
Dupuyer
Marias River
Manson
Conrad
Sheep Cr
Dry Fk
Porter
Brady
Great Falls
Raymond
Bynum
Collins
Farmington
Strabane
Chouteau
Belleview
Saypo
Elizabeth
Deep Cr
Gravel
Dutton
Power
Dry Lake
Fairfield
Sun River
Lowry
Wright Mt
Cleveland Mt
Chief Mt
Divide Mt
Scale in Miles
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Worlds Fair was heavier than the heaviest from any other state.

Teton county contains great expanses of beautiful prairie land, and in the past few years many settlers have moved in and begun farming on unirrigated lands. Yields on dry land farms of from 18 to 35 bushels of spring wheat; 25 to 40 bushels of fall wheat; 40 to 65 bushels of oats; and of 40 and 50 bushels of barley are reported. Potatoes and vegetables have done well. Where the proper systems of cultivation have been followed paying crops have been raised; and the success of these pioneer dry land farmers will lead to the establishment of many thousand farm homes on the broad prairies. The average rainfall is about 16 inches annually. Great quantities of vacant and unappropriated public land are subject to homestead entry. In 1908 the lands of this kind were 1,737,058 acres and in 1911, 825,573 acres. Since the amount of vacant lands was announced from the General Land Office, about 340,000 acres that had been withdrawn for reclamation purposes have been restored to entry. These lands are in the Marias river drainage basin near Cut Bank, include much first class farm land, and are subject to entry at the Great Falls land office where information concerning them may be had.

Streams rising in the Rocky Mountains furnish abundant water for irrigating, and there are many private ditches in the main and smaller valleys. In the Blackfeet Reservation the government is working on a large reclamation project, and in the southern part is the Sun River project, both of which are described elsewhere. Also in the southern part is the Teton project for the reclamation of about 70,000 acres near Brady.

The largest private irrigation project in the state is the Valier Carey Act project which contemplates the reclamation of 170,000 acres. Much of the work has been completed and many acres of land sold, occupied and cultivated. Of the Valier project the Conrad Independent says:

In this project the farmer who is looking for a gilt-edge, dead sure proposition will find just what he wants. The lands are rich beyond description, and with an abundance of water, there will always be an insurance against even a crop shortage, and a failure should never be experienced. It has been pronounced one of the very finest irrigation projects in the world, and rightly so. Lands are sold on easy payments, and some of the very finest lands within the project yet remain to be taken. Forty dollars and fifty cents per acre is the price asked for the lands with the water right, and this sum is divided up into long time payments at a low rate of interest.

The chief crops are hay, oats, wheat, flax, barley, rye and potatoes. Numerous crops averaging from 2 to 6 tons of hay, 30 to 70 bushels of oats, 20 to 50 bushels of wheat and 6 to 12 bushels of flax are reported. Ryan and Withee's wheat crop near Conrad averaged 49 bushels to the acre and Herman Curtiss' barley crop 55 bushels. Accounts of extraordinary yields in 1911 are published in the newspapers. In the Sweet Grass hills Peter Wagner threshed 60 pushels of barley to the acre in a large field, some acres yielding 100 bushels. J. R. Young threshed from a field of 80 acres 18 1-2 bushels of flax per acre, and G. H. McMillan 20 1-2 bushels of flax per acre from eleven acres. Charles May threshed 90 bushels of oats to the acre near Valier. The Valerian contains the following account of a remarkable yield of oats and vouches for its accuracy:

On Friday, Sept. 15, 1911, Samuel Morgan, whose irrigated land lies seven miles northeast of Valier, threshed oats that went 103 measured bushels to the acre. These oats weighed 48 pounds to the measured bushel. At 32 pounds to the bushel which is the standard weight, Mr. Morgan's yield was 154½ bushels per acre of standard weight oats. At $1 per cwt. which is market quotation at the Valier elevator today, the crop returns were $94.44 per acre. A crop bringing $94.44 on land that cost $40.50 per acre with the privilege of fourteen years in which to pay for same is, all must admit, going some.

Flax has made large yields in several districts; and of the Conrad neighborhod an expert of the American Linseed Oil Company said to a reporter of the Great Falls Tribune that it was "the best flax country in the world." John A. Nelson raised 125 bushels of spelt on two acres. Cabbages exceeding twenty pounds in weight were grown in widely separated parts of the county. Affidavits establish the fact that one turnip, raised by H. O. Burton at Valier and given by him to the Hotel Dean at Conrad, was so large that it provided a side dish of turnips to each fifty people who took dinner at the hotel Oct. 9, 1911. A turnip grown by Clermont Yerkes weighed 16 1-2 pounds. Six potatoes from John Beachem's place near Valier weighed 24 pounds; L. L. Moore raised 54 bushels from one bushel of seed, and D. F. Mains 251 bushels on five eights of an acre. Jacob Vanderhall, who lives four miles from Conrad, received $75 from the sale of potatoes grown on one quarter of an acre. Mr. Bogart raised sugar beets successfully without irrigation near Conrad; and as the yields are greater on irrigated lands of which there is a great acreage near Conrad and Valier, the location of a beet sugar factory in this neighborhood would be desirable for the land owners and profitable to the factory owners.

In the mountain ranges are indications of minerals, but little work has been done. Coal is mined in a small way at several places; and there are indications of petroleum.

The chief towns are Choteau, Conrad, Valier, Shelby, Cut Bank and Sweet Grass. Sweet Grass is at the Canadian line and is a trading point for the Sweet Grass hills region. Cut Bank is a railroad and trading point adjoining the Blackfeet reservation and a convenient point from which to reach the large tracts that have recently been restored to entry. Shelby is a railroad junction point near which many new settlers have located. All are growing towns in rapidly developing neighborhoods. Valier is the terminus of the Montana Western Railway which connects at Conrad with the Great Northern Railroad and is in the center of the Conrad-Valier project. It is located on Lake Frances, a large and beautiful artificial lake, and has grown in three years to be a large, busy and well built town. It has an electric light and power plant, a water works system, cement sidewalks, two telephone systems, elevators, a stone school building, a brick depot, two churches, stores, a bank, a newspaper, numerous fine residences and a hotel building that cost $50,000. Valier is a marvel for its age, and is an example of the energy and ability that is bringing about the remarkable development Montana is undergoing.

Conrad, the chief town, had a population of 888 in 1910 which has since much increased; and 200,000 acres of irrigated and 600,000 acres of unir-

rigated land are tributary to it. It is an incorporated city, has good schools, a library, water works, sewers, two telephone exchanges, banks, business houses, elevators, a newspaper, and is a growing place. In October, 1911 Conrad headed the list of shipping points on the Great Northern in Montana sending out 250 carloads of freight.

Choteau, the county seat, is not yet reached by a railroad. It is a well built and prosperous town surrounded by a very productive country and has good schools, churches, banks, professional men, a newspaper, and numerous business houses.

The population of Teton county in 1900 was 5,080 and 9,546 in 1910, an increase of 88 per cent. The assessed valuations were $6,380,889 in 1908 and $9,800,136 in 1911, an increase of 54 per cent in three years.

For further information application should be made to the secretaries of the Commercial Clubs at Conrad, Choteau and Shelby.

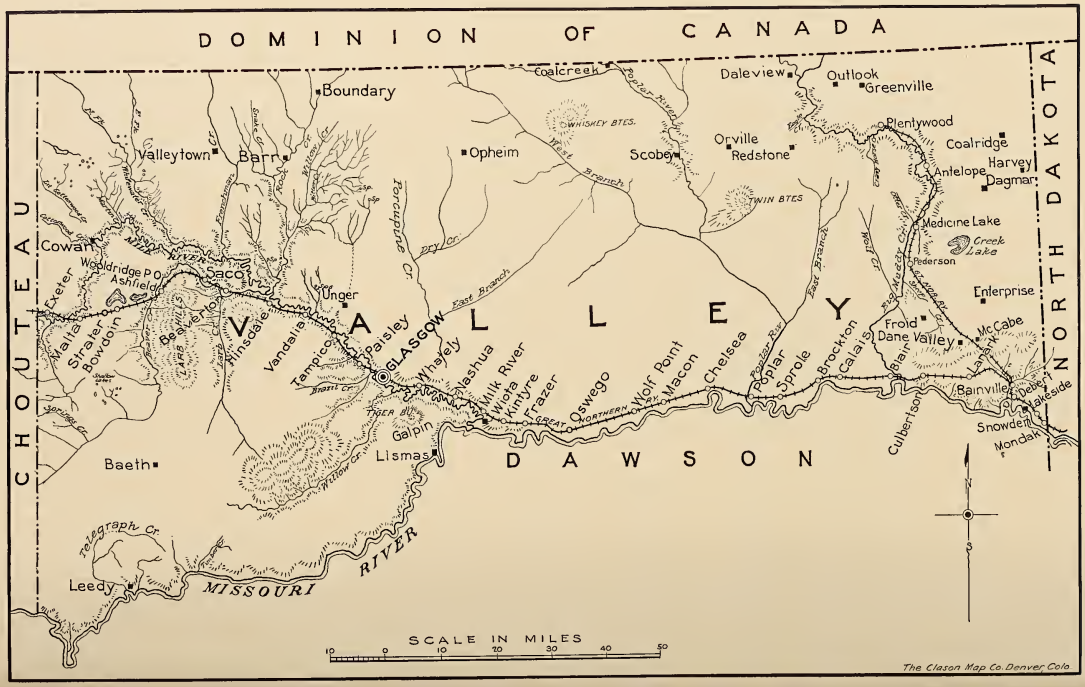
VALLEY COUNTY.

Valley county, which occupies the northeast corner of the state and is the gateway county for those entering by the Great Northern Railway, embraces 13,368 square miles. From this great area must be deducted the Fort Peck Indian Reservation in considering the amount of land now available for settlement although it is expected that this reservation will be opened in a short time.

The Missouri river is the southern boundary, and the land rises north to the Canadian boundary line. It is a region of prairies and rolling country through which flow the Big Muddy, Poplar and Milk rivers, the latter having a large valley a large part of which will be irrigated by the Milk river reclamation project. The irrigated lands along the streams produce the usual bountiful crops of hay, wheat, grain and vegetables. Until a few years ago stock raising was the main industry and is still of great importance, but is yielding first place to agriculture. The bench lands and prairies have been settled upon by thousands of homeseekers who have transformed large parts of the county into productive farming regions. The lands are fertile, the climate good, and the rainfall sufficient for the profitable production of crops without irrigation when proper methods of cultivation are followed. The success of those who began farming on the bench lands a few years ago soon became known from private letters to relatives and friends and by other means, and the result has been a very large immigration.

The population in 1900 was 4,355 and 13,630 in 1910, an increase of 9,275 or 213 per cent. The assessed valuations in 1908 were $6,771,837 and $9,849,933 in 1911, an increase in three years of 45 per cent. In 1905 there were only 13 public school teachers in the county; in 1910 there were 74, and 97 in 1911. The number of public school pupils increased from 2,484 in 1910 to 3,708 in 1911. The vacant and unappropriated public lands in 1908 were 5,419,277 acres and 5,113,022 in 1911 described as "agricultural and grazing."

On unirrigated lands in the vicinity of Malta 40 to 70 bushels of oats,


DOMINION OF CANADA
CHOUTEAU
NORTH DAKOTA
VALLEY
DAWSON
Boundary
Coalcreek
Daleview
Outlook
Greenville
Plentywood
Coalridge
Antelope
Harvey
Dagmar
Valleytown
Barr
Opheim
Scobey
Orville
Redstone
Medicine Lake
Creek
Lake
Pederson
Enterprise
Froid
Dane Valley
McCabe
Cowan
Exeter
Woldridge P.O.
Ashfield
Saco
Unger
Paisley
GLASGOW
Whitley
Nashua
Milk River
Wiota
Vinyre
Frazer
Oswego
Wolf Point
Macon
Chelsea
Poplar
Sprole
Brockton
Calais
Culbertson
Bainville
Peerless
Snowden
Mondak
Wakeside
Vandalia
Tampico
Hinsdale
Walla
Strayer
Bowdoin
Beswick
Galpin
Lismas
Baeth
Leedy
MISSOURI RIVER
Telegraph Cr.
Porcupine Cr.
Big Cr.
Whitley Bte.
Twin Bte.
West Branch
East Branch
Poplar River
Big Muddy Cr.
Wolf Cr.
Lake
SCALE IN MILES
10 0 10 20 30 40 50
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30 to 50 bushels of wheat, 30 to 50 bushels of rye and 15 bushels of flaxseed are reported to have been raised. A letter from the county assessor written in August 1911 states that of the patented land 14,500 acres of grain land and 21,648 acres of hay land were in cultivation and that 800,000 acres of government land were in cultivation. The principal crop is flax. Joe Lafond told the Malta Enterprise that he harvested 28 bushels of flaxseed to the acre from 3 1-2 acres. J. B. Masterson threshed 13 bushels of flax to the acre and 30 bushels of oats. On irrigated land Hon. John Survant obtained yields of 18 2-3 bushels of flax, 42 1-2 bushels of wheat and 60 bushels of oats to the acre. J. H. Atwood raised 40 bushels of corn to the acre. Dan McKay had 10,000 cabbages. Anton Kott of Poplar is reported to have haised a mangelroot weighing 12 pounds, a sugar beet nearly 9 pounds, and a common beet 9 1-2 pounds. F. P. Atkinson brought to the office of the Hinsdale Homestead a pumpkin that weighed 40 pounds. Near Galpin, O. G. Hinaman raised good peanuts. C. W. Wilkins of Wiota had excellent success with potatoes, cucumbers, corn, and showed perfectly matured plums measuring five inches in circumference. M. L. Wilson, an agricultural expert, declared that the field of corn he saw growing on a place of D. M. Moothart near Culbertson was the best looking field of corn he had ever seen in Montana. On dry land near Culbertson J. M. Fleischman raised a ten pound turnip; A. Larson of Scobey reports a crop of 4,000 bushels of flax from 350 acres. Good yields of oats, hay, barley, and other crops are reported from all sections. The new settlers are "making good," adding to the improvements on their farms, and increasing every year the acreage in cultivation. What one of them thinks of the country was expressed in the following letter to J. H. Hall, Commissioner of the Bureau of Agriculture, Labor and Industry:

Poplar, Mont., November 30, 1911.

Dear Sir: I came here in 1908 (from St. Johns, N. Dak.) and settled upon a homestead. When I arrived all I had to start with was a team of small horses and practically broke. My conditions were such that I have not been able to farm extensively. I have 35 acres broke and have a comfortable small house to live in. I now have ten head of horses and am in a position to devote more of my time to farming. I have been raising good crops of all kinds every year; but on account of the fact that I have five small children, I have been doing team work, such as hauling coal and wood to market, and breaking sod for my neighbors to keep out of debt in which I have been very successful. I think this is the best poor man's country on earth, and the only thing I have to regret is that I didn't come here years ago. Enclosed is a kodak picture of my home. There is a large amount of free land left yet in this part of Montana. Very respectfully,

O. F. KALBOW.

The Hinsdale Homestead sums up the opportunities for the homeseeker in these words:

According to statistics Valley county has 5,419,297 acres of land classed as agricultural and grazing lands. Dividing this vast territory into farm units of 160 acres each, and one family to a unit of 160 acres we find room in this county for 33,870 farm families. Then figure five to a family, and this is the general rule for estimating population, and we find that Valley county has farm room for an army of 169,350 people. And this does not include the population of the towns and cities of the county. Great are the possibilities for Valley county.

Coal is abundant and farmers get their supplies of fuel from neighboring coal banks.

The main line of the Great Northern Railroad enters the state at Mondak and follows first the Missouri and then the Milk river valleys to the western boundary. A branch line extends from Bainville to Plentywood, a distance of 53 miles. The country along this line has been settled within the past few years and Froid, Medicine Lake, Plentywood, and other trading places with business hfouses, banks, elevators, and newspapers, have sprung up. Mondak and Bainville in the Missouri river valley have business houses, banks, elevators, and newspapers. Culbertson a well built town of about 600 population, is the trading point for a well developed agricultural section and has elevators, banks, stores and two newspapers. Poplar, in the Fort Peck Indian Reservation, has an extensive trade, and Malta in the Milk River Valley is developing rapidly and the towns are all growing. Malta is the chief town in the western part of the county, is making many civic improvements, has banks, a newspaper, business houses, churches, a good hotel and ships quantities of blue joint hay and many cars of cattle, wool and sheep.

Glasgow, the county seat and principal town has a population of 1,158, is the seat of the United States Land Office, has electric lights, water works, a sewerage system, excellent schools, a public library, two newspapers, good hotels and many business houses. It is a division point on the Great Northern and a large railroad payroll contributes to its prosperity. Glasgow is a busy and growing town.

Further information may be obtained by applying to the secretaries of the Commercial Clubs at Culbertson, Froid, Glasgow, Hinsdale, Malta, Mondak and Poplar.

YELLOWSTONE COUNTY.

Yellowstone, the most populous and important county in the Yellowstone valley, has grown remarkably in population and wealth. Population grew from 6,212 in 1900 to 22,944 in 1910, an increase of 270 per cent. The assessed valuation was $5,178,688 in 1900 and $17,976,666 in 1911, an increase of 247 per cent. Notwithstanding the loss of property assessed at $2,250,000, of considerable population, of 691,200 acres of land reducing the area from 5,789 square miles to 4,709 square miles by the creation of Musselshell county, the total valuation of property in 1911 was 19 per cent greater than in 1908. The unreserved and unappropriated public lands were 1,611,398 acres in 1908 and 953,492 acres in 1911.

The county is named for the Yellowstone river which crosses it from the western to the eastern boundary and has an extensive valley. The Big Horn river forms the eastern boundary. Mountain ranges in the north, south and west afford protection, and modify the climate. During the past five years the average temperature for December, January and February has been 29 degrees above zero. Spring opens early; and plowing and planting is commonly done before the rainy season, April, May and June, in which months half of the annual rainfall of over 15 inches falls.

MUSSELSHELL
Wolfspring
Pineview
Junction
Custer
Broadview
Shorey
Antelope
Molts
Comanche
Acton
Stickley
Big Lake
Worden
Newlon
Yellowstone
Waco
Bull Mtn
Foster
Huntley
Ballantine
Anita
YELLOWSTONE
Rimrock
Lockwood
Corinth
BILLINGS
Toluca
Hesper
Great Northern Jct
Park City
Laurel
Rapids
Foster
Coburn
Morin
Keiser
Pryor
Chicopee
Oswald
Crockett
Big Horn
Roundup
CARBON
SCALE IN MILES
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The long days of sunshine are ideal for the growing, maturing, and harvesting of crops.

The rural industries are stock raising and farming. Yellowstone county has long been noted for the number and excellence of its live stock, and great quantities of wool and numerous cars of cattle and sheep are annually shipped. In addition to raising live stock another phase of the live stock industry has assumed large importance viz., the feeding and fattening of cattle and sheep for the market. Hog raising is also being very profitably pursued. The conditions are ideal for dairying.

Farming is of irrigated and non-irrigated land. About 268,000 acres are under irrigation. Irrigated lands may be purchased at prices varying from $35 to $50 on the newer projects to $75 to $150 under the older ditches. In other chapters will be found accounts of the Huntley reclamation project, of the Billings Carey Act project, and of the great crops of sugar beets raised in the vicinity of Billings. The average crops of the irrigated districts are very high, and some remarkable yields are reported. Alfalfa and sugar beets are the great crops in the valley, the yield of the former being from 3 to 6 tons and of the latter from 12 to 20 tons; oats yield from 50 to 90 bushels, wheat from 40 to 60, and corn from 30 to 50 bushels. Barley of the finest malting kind is grown. Potatoes yield from 200 to 400 bushels; and the largest known yield from one acre, 1,213 bushels, was made in this county. Berries are very profitable; apples do splendidly, and many orchards have been set out. Fruit growing is an increasing industry and already the value of orchard products amounts to a large sum annually.

Away from the valleys and the irrigated districts farming is carried on without irrigation and is called upland farming or dry land farming. A table of crop yields at the experiment farm in Yellowstone county, which was established on land typical of millions of acres in this section of Montana, will be found on another page. Individual farmers have made as good crops. Concerning the unirrigated farm lands of Yellowstone county a pamphlet issued by the Billings Chamber of Commerce says:

The staple crop is winter wheat, which yields abundantly and is of excellent quality. Spring crops such as flax, durum wheat, speltz, oats and barley do well. Alfalfa produces without irrigation as good a crop as clover in the eastern states and is the staple forage plant. Alfalfa seed grown on the uplands of eastern Montana has been pronounced superior to all other alfalfa seed by the Department of Agriculture at Washington. Alfalfa seed is better and grain grown on the uplands under non-irrigated methods is heavier and more nourishing than what is grown under other conditions. Yields of grain from commercial or large fields have frequently shown large returns—oats, 80 bushels per acre; wheat, 53 bushels; flax, 15 bushels; speltz, 40 bushels; corn, 30 bushels. Wheat from the non-irrigated sections of this county in competition with the world at the International Dry Farming Congress at Cheyenne, Wyo., took sweepstakes prize. The vegetables grown on non-irrigated land are of excellent flavor, quality and the yields are large. Potatoes are a staple crop. Fruit does well when given the proper care and attention.

At the present time wonderful opportunities are offered the farmers on the non-irrigated farm lands in the way of stock raising. Nearly everywhere, in the vicinity of the non-irrigated cultivatable lands in Yellowstone county, there is some good grazing land for pasturing the dairy herd, the extra horses, a bunch of beef cattle

or a few sheep. The farmer can graze his stock in summer and feed them in winter the grain and other produce he raises thus increasing the revenue of his ranch several fold.

W. B. George in 1911 harvested 500 acres of unirrigated wheat which yielded an average of 26 bushels to the acre, and 200 acres of barley that averaged 25 bushels. William Flannery gathered an immense quantity of flaxseed from a 700 acre tract near Toluca which was planted for the first time.

Yellowstone county dry land products have won many prizes at expositions. At the Dry Land Congress of 1908 W. B. George won the silver cup for the best 25 pounds of wheat. Miss Mabel Sudduth won first prize for the best display made by a woman homesteader, first for sheaf flax, second for alfalfa and third for barley; Dr. W. X. Sudduth won second prize for wheat, flax, and field peas and third for durum wheat and beans. In the sweepstakes the county won three of the five first prizes. At the great New York Land Show in 1911, Dr. W. X. Sudduth won the cup for alfalfa.

On an earlier page is printed the balance sheet of I. D. O'Donnell which shows the remarkable profits that may be secured by good farming in this productive valley. E. B. Lutes brought to Laurel a pumpkin that weighed 79 1-2 pounds. F. W. Schauer left at the office of the Laurel Sentinel an apple that measured 12 inches in circumference. On his ranch near Billings Robert Steel threshed fifty acres of oats. The grain weighed 48 pounds to the bushel and there were 105 bushels to the acre. Taking the total weight of the oats harvested and dividing it by 32 pounds, which is the legal weight of a bushel, the yield was 157 bushels to the acre.

The Northern Pacific Railroad's main line follows the Yellowstone river across the county and branch lines extend from Billings via Laurel to Red Lodge and Bridger, Carbon county. The Billings and Northern division of the Great Northern runs north to Great Falls. Communications with Omaha, Denver, points on the Crow reservation, and northern Wyoming is afforded by the Burlington system. From the Musselshell valley the Milwaukee is expected to build a branch line to Billings. A branch to Columbus is also a possibility.

The chief towns are Billings and Laurel. Others are Huntley, Ballantine and Hardin in the Huntley project; Park City in the Yellowstone valley which is surrounded by a highly improved farming region, and Columbus in the same section which is a prosperous place with large stores, bank, newspaper, and is the trading point for the Stillwater valley to the south and the rapidly developing Lake Basin country on the north; and Broadview and Comanche on the Billings and Northern division of the Great Northern Railroad in a part of the country that has been transformed in the past few years from a stock range to a farming region.

Laurel is an example of how towns grow in Montana. A few years ago the population was about 200 and today it is about 1,500. It is surrounded by a fertile and extensive district of irrigated lands and its trade extends back to the bench lands that are being converted into farms. It is located opposite the mouth of Clarks Fork river whose valley is one of the

most productive in Montana. Laurel is a very important railroad point and is on the Northern Pacific, the Burlington and the Great Northern railroads. New railroad shops and roundhouses have recently been built at Laurel at a cost of $3,000,000 and the railroad payroll is a large one. There are good schools, six churches, two banks, a creamery, two newspapers, water and sewer systems of recent construction, and many business houses.

Billings, the county seat, is the center of an irrigated area of approximately 500,000 acres and of non-irrigated farming country of 1,000,000 acres, ships great quantities of live stock, wool, hides and grain, is the headquarters for 160 traveling salesmen and of numerous branch houses of large firms, has many jobbing houses, and wholesale and retail stores. There are seven banking houses, numerous churches, good public schools, a polytechnic institute representing an investment of $200,000, costly society buildings, two daily newspapers, and all the conveniences and improvements of an up-to-date city. Billings has numerous manufacturing establishments the most important being the beet sugar factory which pays out annually about $1,000,000 in payment for beets. Hydro-electric power is abundant and 50,000 horse power is now available. The population was 3,221 in 1900 and 10,031 in 1910 an increase of 211 per cent. The people fo Billings are noted for their public spirit and enterprise. President Taft, said last fall at Billings:

"I haven't seen all of Montana, but from the sample I have seen I think it justifies the enthusiasm which the people of Montana have for its future. This part of Montana is the center of the new agriculture of the West."

Further information may be had by applying to the secretaries of the Commercial Clubs at Billings, Columbus, Hardin, Huntley, Laurel, and Park City.

APPENDIX.

SUGGESTIONS TO HOMESTEADERS AND PERSONS DESIRING TO MAKE HOMESTEAD ENTRIES.

Department of the Interior,
General Land Office,
Washington, D. C., September 24, 1910.

1. Persons desiring to make homestead entries should first fully inform themselves as to the character and quality of the lands they desire to enter, and should in no case apply to enter until they have visited and fully examined each legal subdivision for which they make application, as satisfactory information as to the character and occupancy of public lands can not be obtained in any other way.

As each applicant is required to swear that he is well acquainted with the character of the land described in his application, and as all entries are made subject to the rights of prior settlers, the applicant can not make the affidavit that he is acquainted with the character of the land, or be sure that the land is not already appropriated by a settler, until after he has actually inspected it.

Information as to whether a particular tract of land is subject to entry may be obtained from the register or receiver of the land district in which the tract is located, either through verbal or written inquiry, but these officers must not be expected to give information as to the character and quality of unentered land or to furnish extended lists of lands subject to entry, except through plats and diagrams which they are authorized to make and sell as follows:

For a township diagram showing entered land only $1.00
For a township plat showing form of entries, names of claimants, and character of entries 2.00
For a towiship plat showing form of entries, names of claimants, character of entry, and number 3.00
For a township plat showing form of entries, names of claimants, character of entry, number, and date of filing or entry, together with topography, etc.... 4.00

Purchasers of township diagrams are entitled to definite information as to whether each smallest legal subdivision, or lot, is vacant public land. Registers and receivers are therefore required in case of an application for a township diagram showing vacant lands, to plainly check off with a cross, every lot or smallest legal subdivision in the township which is not vacant, leaving the vacant tracts unchecked. There is no authority for registers and receivers to charge and receive a fee of 25 cents for plats and diagrams of a section or part of a section of a township.

If because of the pressure of current business relating to the entry of lands registers and receivers are unable to make the plats or diagrams mentioned above, they may refuse to furnish the same and return the fee to the applicant, advising him of their reason for not furnishing the plats requested, that he may make the plats or diagrams himself, or have same made by his agent or attorney, and that he may have access to the plats and tract books of the local land office for this purpose, provided such use of the records will not interfere with the orderly dispatch of the public business.

A list showing the general character of all public lands remaining unentered in the various counties of the public-land States on the 30th day of the preceding June may be obtained at any time by addressing "The Commissioner of the General Land Office, Washington, D. C."

All blank forms of affidavits and other papers needed in making application to enter or in making final proofs can be obtained by applicants and entrymen from the land office for the district in which the land lies.

2. Kind of Land Subject to Homestead Entry.—All unappropriated surveyed public lands adaptable to any agricultural use are subject to homestead entry if they are not mineral or saline in character and are not occupied for the purposes of trade or business and have not been embraced within the limits of any withdrawal, reservation, or incorporated town or city; but homestead entries on lands within certain areas (such as lands in Alaska, lands withdrawn under the reclamation act, certain

ceded Indian lands, lands within abandoned military reservations, agricultural lands within national forests, lands in western and central Nebraska, and lands withdrawn, classified, or valuable for coal) are made subject to the particular requirements of the laws under which such lands are opened to entry. None of these particular requirements are set out in these suggestions, but information as to them may be obtained by either verbal or written inquiries addressed to the register and receiver of the land office of the district in which such lands are situated.

How Claims Under Homestead Law Originate.

3. Claims under homestead laws may be initiated either by settlement on surveyed or unsurveyed lands of the kind mentioned in the foregoing paragraph, or by the filing of a soldier's or sailor's declaratory statement, or by the presentation of an application to enter any surveyed lands of that kind.

4. Settlements May Be Made Under the Homestead Laws by all persons qualified to make either an original or a second homestead entry, as explained in paragraphs 6 and 13, and in order to make settlement a settler must personally go upon and improve or establish residence on the land he desires. By making settlement in this way the settler gains the right to enter the land settled upon as against all othr persons, but not as against the Government should the land be withdrawn by it for other purposes.

A settlement made on any part of a surveyed technical quarter section gives the settler the right to enter all of that quarter section which is then subject to settlement, although he may not place improvements on each 40-acre subdivision; but if the settler desires to initiate a claim to surveyed tracts which form a part of more than one technical quarter section he should perform some act of settlement—that is, make some improvement—on each of the smallest legal subdivisions desired. When settlement is made on unsurveyed lands, the settler must plainly mark the boundaries of all the lands claimed by him.

The settlement must be made by the settler in person, and cannot be made by his agent, and each settler must, within a reasonable time after making his settlement, establish and thereafter continuously maintain an actual residence on the land, and if he fails to do this, or, in case of his death, his widow, heirs, or devisees fail to continue cultivation or residence, or if he, or his widow, heirs, or devisees, fail to make entry within three months from the time he first settles on surveyed land, or within three months from the filing in the local land office of the plat of survey of unsurveyed lands on which he made settlement, the right of making entry of the lands settled on will be lost in case of an adverse claim, and the land will become subject to entry by the first qualified applicant.

5. Soldiers' and Sailors' Declatory Statements may be filed in the land office for the district in which the lands desired are located by any persons who may have been honorably discharged after ninety days' service in the army or navy of the United States during the war of the rebellion or during the Spanish-American war or the Phillippine insurrection. Declaratory statements of this character may be filed either by the soldier or sailor in person or through his agent acting under a proper power of attorney, but the soldier or sailor must make enty of the land in person, and not through his agent, within six months from the filing of his declaratory statement, or he may make entry in person without first filing a declaratory statement if he so chooses. If a declaratory statement is filed by a soldier or sailor in person, it must be executed by him before one of the officers mentioned in paragraph 16, in the county or land district in which the land is situated; if filed through an agent, the affidavit of the agent must be executed before one of the officers above mentioned, but the soldiers' affidavit may be executed before any officer using a seal and authorized to administer oaths and not necessarily within the county or land district in which the land is situated.

By Whom Homestead Entries May Be Made.

6. Homestead entries may be made by any person who does not come within either of the following classes:

(a) Married women, except as hereinafter stated.

(b) Persons who have already made homestead entry, except as hereinafter stated.

(c) Foreign-born persons who have not declared their intention to become citizens of the United States.

(d) Persons who are the owners of more than 160 acres of land in the United States.

(e) Persons under the age of 21 years who are not the heads of families, except minors who make entry as heirs, as hereinafter mentioned, or who have served in the army or navy during the existence of an actual war for at least fourteen days.

(f) Persons who have acquired title to or are claiming under any of the agricultural public-land laws, through settlement or entry made since August 30, 1890, any other lands which, with the lands last applied for, would amount in the aggregate to more than 320 acres. See, however, modification hereof in the regulations concerning enlarged homestead entries under the act of February 19, 1909 (par. 52).

7. A Married Woman, who has all of the other qualifications of a homesteader, may make a homestead entry under any one of the following conditions:

(a) Where she has been actually deserted by her husband.

(b) Where her husband is incapacitated by disease or otherwise from earning a support for his family and the wife is really the head and main support of the family.

(c) Where the husband is confined in a penitentiary and she is actually the head of the family.

(d) Where the married woman is the heir of a settler or contestant who dies before making entry.

(e) Where a married woman made improvements and resided on the lands applied for before her marriage, she may enter them after marriage if her husband is not holding other lands under an unperfected homestead entry at the time she applies to make entry.

8. If An Entryman Deserts His Wife, and abandons the land covered by his entry, his wife then has the exclusive right to contest the entry is she has continued to reside on the land, and on securing its cancellation she may enter the land in her own right, or she may continue her residence and make proof in the name of and as the agent for her husband, and patent will issue to him.

9. If An Entryman Deserts His Minor Children and abandons his entry after the death of his wife, the children have the same rights the wife could have exercised had she been deserted during her lifetime.

10. The Marriage of the Entrywoman After Making Entry will not defeat her right to acquire title if she continues to reside upon the land and otherwise comply with the law. A husband and wife can not, however maintain separate residences on homestead entries held by each of them, and if, at the time of marriage, they are each holding an unperfected entry on which they must reside in order to acquire title, they can not hold both entries. In such case they may elect which entry they will retain, and relinquish the other.

11. A Widow, if otherwise qualified, may make a homestead entry notwithstanding the fact that her husband made an entry, and notwithstanding she may be at the time claiming the unperfected entry of her deceased husband.

12. A Person Serving in the Army or Navy of the United States may make a homestead entry if some member of his family is residing on the lands applied for, and the application and accompanying affidavits may be executed before the officer commanding the branch of the service in which he is engaged.

13. Second Homestead Entries may be made by the following classes of persons, if they are otherwise qualified to make entry:

(a) By a former entryman who commuted his entry prior to June 5, 1900.

(b) By a homestead entryman who, prior to May 17, 1900, paid for lands to which he would have been afterwards entitled to receive patent without payment, under the "free-homes act." (Appendix No. 3.)

(c) By any person who for any cause lost, forfeited, or abandoned his homestead entry before February 8, 1908, if the former entry was not canceled for fraud or relinquished for valuable consideration. Where an entryman sells his improvements on the land and relinquishes his entry in connection therewith, or if he receives the amount of his filing fees or any other amount, it is held that he relinquishes for a valuable consideration.

(d) By persons whose original entries have failed because of the discovery subsequent to entry of obstacles which could not have been forseen and which render it impracticable to cultivate the land, or because, subsequent to entry, the land becomes useless for agricultural purposes through no fault of the entryman. There is not specific statute authorizing the making of second entries in these classes of cases, and such entries are allowed under the general equitable power of the land department to grant relief in cases of accident and mistake.

(e) Any person who has already made final proof for less than 160 acres under the homestead laws may, if he is otherwise qualified, make a second or additional entry for such an amount of public land as will, when added to the amount for which he has already made proof, not exceed in the aggregate 160 acres. See, however, instructions under the enlarged homestead act (par. 52).

Any person desiring to make a second entry must first select and inspect the

lands he intends to enter and then make application therefor on blanks furnished by the register and receiver. Each application must state the date and number of his former entry and the land office at which it was made, or give the section, township, and range in which the land entered was located. Any person mentioned in paragraph (c) above must show, by oaths of himself and some other person or persons, the time when his former entry was lost, forfeited, or abandoned, and that it was not cancelled for fraud or abandoned or relinquished for a valuable consideration.

Any person mentioned in paragraph (d) above must, in addition to the above evidence as to date and description of his former entry, date of abandonment, and receipt of no consideration, show, by duly corroborated affidavit, the grounds on which he seeks relief, and that he used due diligence prior to entry to avoid any mistake.

14. An Additional Homestead Entry may be made by a person for such amount of public lands adjoining lands then held and resided upon by him under his original entry as will, when adde to such adjoining lands, not exceed in the aggregate 160 acres. An entry of this kind may be made by any person who has not acquired title to and is not, at the date of his application, claiming under any of the agricultural public land laws, through settlement or entry made since August 30, 1890, any other lands which, with the land then applied for, would exceed in the aggregate 320 acres, but the applicant will not be required to show any of the other qualifications of a homestead entryman. See, however, instructions under the enlarged homestead act (par. 50).

15. An Adjoining Farm Entry may be made for such an amount of public lands lying contiguous to lands owned and resided upon by the applicant as will not, with the lands so owned and resided upon, exceed in the aggregate 160 acres; but no person will be entitled to make entry of this kind who is not qualified to make an original homestead entry. A person who has made one homestead entry, although for a less amount than 160 acres, and perfected title thereto is not qualified to make an adjoining farm entry.

How Homestead Entries Are Made.

16. A homestead entry may be made by the presentation to the land office of the district in which the desired lands are situated of an application properly prepared on blank forms prescribed for that purpose and sworn to before either the register or the receiver, or before a United States commissioner, or a United States court commissioner, or a judge, or a clerk of a court of record in the county or parish in which the land lies, or before any officer of the classes named who resides in the land district and nearest and most accessible to the land, although he may reside outside of the county in which the land is situated.

17. Each application to enter and the affidavits accompanying it must recite all the facts necessary to show that the applicant is acquainted with the land; that the land is not, to the applicant's knowledge, either saline or mineral in character; that the applicant possesses all of the qualifications of a homestead entryman; that the application is honestly and in good faith made for the purpose of actual settlement and cultivation, and not for the benefit of any other person, persons, or corporation; that the applicant will faithfully and honestly endeavor to comply with the requirements of the law as to settlement, residence and cultivation necessary to acquire title to the land applied for; that the applicant is not acting as the agent of any person, persons, corporation, or syndicate in making such entry, nor in collusion with any person, corporation, or syndicate to give them the benefit of the land entered or any part thereof; that the application is not made for the purpose of speculation, but in good faith to obtain a home for the applicant, and that the applicant has not directly or indirectly made, and will not make, any agreement or contract in any way or manner with any person or persons, corporation, or syndicate whatsoever by which the title he may acquire from the Government to the lands applied for shall inure, in whole or in part, to the benefit of any person except himself.

18. All applications to make second homestead entries must, in addition to the facts specified in the preceding paragraph, show the number and date of the applicant's original entry, the name of the land office where the original entry was made, and the description of the land covered by it, and it should state fully all of the facts which entitle the applicant to make a second entry.

19. All applications by persons claiming as settlers must, in addition to the facts required in paragraph 17, state the date and describe the acts of settlement under which they claim a preferred right of entry, and applications by the widows, devisees, or heirs of settlers must state facts showing the death of the settler and their right to make entry; that the settler was qualified to make entry at the time of his death, and that the heirs or devisees applying to enter are citizens of the United States or

have declared their intentions to become such citizens, but they are not required to state facts showing any other qualifications of a homestead entryman, and the fact that they have made a former entry will not prevent them from making an entry as such heirs or devisees, nor will the fact that a person has made entry as the heir or devisee of the settler prevent him from making an entry in his own individual right, if he is otherwise qualified to do so.

20. All applications by soldiers, sailors, or their widows, or the guardians of their minor children should be accompanied by proper evidence of the soldier's or sailor's service and discharge, and of the fact that the soldier or sailor had not, prior to his death, made an entry in his own right. The application of the widow of the soldier or sailor must also show that she is unmarried, and that the right has not been exercised by any other person. Applications for the children of soldiers or sailors must show that the father died without having made entry, that the mother died or remarried without making entry, and that the person applying to make entry for them is their legally appointed guardian.

Rights of Widows, Heirs, or Devisees Under the Homestead Laws.

21. If a homestead settler dies before he makes entry, his widow has the exclusive right to enter the lands covered by his settlement, and if thre be no widow, thn any person to whom he has devised his settlement rights by proper will has the exclusive right to make the entry; but if the settler dies leaving neither widow nor will, then the right to enter the lands covered by his settlement passes to the persons who are named as heirs by the laws of the State in which the land lies. The persons to whom the settler's right of entry passes must make entry within the time named in paragraph 4 or they will forfeit their right to the next qualified applicant. They may, however, make entry after that time if no adverse claim has attached.

22. If a homestead entryman dies before making final proof his rights under his entry will pass to his widow; or if there be no widow, and the entryman's children are all minors, the right to a patent vests in them upon making publication of notice and proof of the death of the entryman without a surviving widow, that they are the only minor children and that there are no adult heirs of the entryman, or the land may be sold for the benefit of such minor children in the manner in which other lands belonging to minors are sold under the laws of the State or Territory in which the lands are located.

If the children of a deceased entryman are not all minors and his wife is dead, his rights under his entry pass to the person to whom such rights were devised by the entryman's will, or if an entryman dies without leaving either a widow or a will, and his children are not all minors, his rights under his entry will pass to the persons who are his heirs under the laws of the State or Territory in which the lands are situated.

23. If a contestant dies after having secured the cancellation of an entry his right as a successful contestant to make entry passes to his heirs; and if the contestant dies before he has secured the cancellation of the entry he has contested, his heirs may continue the prosecution of his contest and make entry if thy are successful in the contest. In either case to entitle the heirs to make entry they must show that the contestant was a qualified entryman at the date of his death; and in order to earn a patent the heirs must comply with all the requirements of the law under which the entry was made to the same extent as would have been required of the contestant had he made entry.

No foreign-born persons can claim rights as heirs under the homestead laws unless they have become citizens of the United States or have declared their intentions to become citizens.

24. The unmarried widow, or, in case of her death or remarriage, the minor children of soliders and sailors who were honorably discharged after ninety days' actual sevice during the war of the rebellion, the Spanish-American war, or the Philippine insurrection may make entry as such widow or minor children if the soldier or sailor died without making entry. The minor children must make a joint entry through their duly appointed guardian.

Residence and Cultivation.

25. The residence and cultivation required by the homestead law means a continuous maintenance of an actual home on the land entered, to the exclusion of a home elsewhere, and continuous annual cultivation of some portion of the land. A mere temporary sojourn on the land, followed by occasional visits to it once in six months or oftener, will not satisfy the requirements of the homestead law, and may result in the cancellation of the entry.

26. No specific amount of either cultivation or improvements is required where

entry is made under the general homestead law, but there must in all cases be such continuous improvement and such actual cultivation as will show the good faith of the entryman. Lands covered by such a homestead entry may be used for grazing purposes if they are more valuable for pasture than for cultivation to crops. When lands of this character are used fo pasturage, actual grazing will be accepted in lieu of actual cultivation. The fact that lands covered by homesteads are of such a character that they can not be successfully cultivated or pastured will not be accepted as an excuse for failure to either cultivate or graze them.

Homestead Entries for Coal Lands.—Where homestead entry is made under the act of June 22, 1910 (36 Stat., 583), for land which has been withdrawn or classified as coal land, or which is valuable for coal, the entryman must show improvements as above stated and must further comply with the requirements of the enlarged homestead act of February 19, 1909 (35 Stat., 639), as to residence and cultivation; that is, he must cultivate at least one-eighth of the area of the entry to agricultural crops other than native grasses, beginning with the second year of the entry, and at least one-fourth of the area of the entry beginning with the third year of the entry and continuing to the date of proof. Entries in this class can not be commuted. (See par. 51.)

27. Actual residence on the lands entered must begin within six months from the date of all homestead entries, except additional entries and adjoining farm entries of the character mentioned in paragraphs 14 and 15, and residence with improvements and annual cultivation must continue until the entry is five years old, except in cases hereafter mentioned; but all entrymen who actually resided upon the cultivated lands entered by them prior to making such entries may make final proof at any time after entry when they can show five years' residence and cultivation.

Under certain circumstances, leaves of absence may be granted in the manner pointed out in paragraph 36 of these suggestions, but the entryman can not claim credit for residence during the time he is absent under such leave.

An extension of time for establishing residence can be granted only in cases where the entryman is actually prevented by climatic hindrances from establishing his residence within the required time. This extension can not be granted in advance; but on making final proof or in case a contest is instituted against the entry the entryman may show the storms, floods, blockades of snow or ice, or other climatic reasons which rendered it impossible for him to commence residence within six months from date of entry, and he must as soon as possible after the climatic hindrances disappear establish his residence on the land entered. Failure to establish residence within six months from date of entry will not necessarily result in a forfeiture of the entry, provided the residence be established prior to the intervention of an adverse claim.

After an entryman has fully complied with the law and has submitted proof he is no longer required to live on the land. But all entrymen should understand that if they discontinue their residence on the land prior to the issuance of patent they do so at their risk, and by so doing may place themselves in such a position that they may be unable to comply with requirements made by the General Land Office, should their proof on examination there be found unsatisfactory.

28. Residence and cultivation by soldiers and sailors of the classes mentioned in paragraph 5 must begin within six months from the time they file their declaratory statements regardless of the time when they make entry under such statement, but if they make entry without filing a declaratory statement they must begin their residence within six months from the date of such entry, and residence thus established must continue in good faith, with improvements and annual cultivation for at least one year, but after one year's residence and cultivation the soldier or sailor is entitled to credit on the remainder of the five-year period for the term of his actual naval or military service, or if he was discharged from the army or navy because of wounds received or disabilities incurred in the line of duty he is entitled to credit for the whole term of his enlistment. No credit can be allowed for military service where commutation proof is offered.

29. A soldier or sailor making entry during his enlistment in time of peace is not required to reside personally on the land, but may receive patent if his family maintain the necessary residence and cultivation until the entry is five years old or until it has been commuted; but a soldier or sailor is not entitled to credit on account of his military service in time of peace. And if such soldier has not family, there is no way by which he can make entry and acquire title during his enlistment in time of peace.

30. Widows and minor orphan children of soldiers and sailors who make entry as such widows and children must begin their residence and cultivation of the lands entered by them within six months from the dates of their entries, or the filing of declaratory statement, and thereafter continue both residence and cultivation for

such period as will, when added to the time of their husbands' or fathers' military or naval service, amount to five years from the date of the entry, and if the husbands or fathers either died in the service or were discharged on account of wounds or disabilities incurred in the line of duty, credit for the whole term of their enlistment, not to exceed four years, may be taken, but no patent will issue to such widows or children until there has been residence and cultivation by them for at least one year. No credit can be allowed for military service where commutation proof is offered.

31. Persons who make entry as heirs of settlers are not required to both reside upon and cultivate the land entered by them, but they must, within six months from the dates of their entries, begin and thereafter continuously maintain either residence or cultivation on the land entered by them for such a period of time as, added to the time during which the settler resided on and cultivated the land, will make five years, unless their entries be sooner commuted. Commutation proof can not, however, be made unless at least fourteen months' actual residence is shown, performed either by the settler or the heirs or in part by the settler and in part by the heirs.

32. The widow, heirs, or devisees of a homestead entryman who dies before he earns patent are not required to both reside upon and cultivate the lands covered by his entry, but they must, within six months after the death of the entryman, begin either residence or cultivation on the land covered by the entry, and thereafter continuously maintain either residence or cultivation for such a period of time as will, when added to the time during which the entryman complied with the law, amount in the aggregate to the required five years, unless they sooner commute the entry. But commutation proof can not be made unless fourteen months' actual residence can be shown, performed by the entryman or by the widow, heirs, or devisees, or in part by the entryman and in part by the widows, heirs, or devisees.

33. Homestead entrymen who have been elected to either a federal, state, or county office, after they have made entry and established an actual residence on the land covered by their entries are not required to continue such residence during their term of office, if the discharge of their bona fide official duties necessarily requires them to reside elsewhere than upon the land; but they must continue their cultivation and improvements for the required length of time. Such an office-holder can not commute, however, unless he can show at least fourteen months' actual residence. See circulars of February 16 and 20, 1909 (Appendix No. 13), and October 18, 1907 (Appendix No. 14).

A person who makes entry after he has been elected to office is not excused from maintaining residence, but must comply with the law in the same manner as though he had not been elected.

34. Residence is not required on land covered by an adjoining farm entry of the kind mentioned in paragraph 15; but a person who makes an adjoining farm entry is not entitled to a patent until he has continued his residence and cultivation for the full five years on the land owned by him at the time he made entry, or on the adjoining lands entered by him, unless he commutes his entry after fourteen months' residence on either the entered lands or the lands originally owned by him; in neither case can credit be claimed for residence on the original farm prior to the date of the adjoining farm entry.

A person who has made an additional entry of the kind mentioned in paragraph 14 for lands adjoining his original entry is not entitled to patent for the lands so entered until he can show five years' residence, either on the original and in part on the additional. No commutation of the additional entry is allowed by law in the latter case.

35. Neither residence nor cultivation by an insane homestead entryman is necessary after he becomes insane, if such entryman made entry and established residence before he became insane and complied with the requirements of the law up to the time his insanity began.

Leaves of Absence.

36. Leaves of absence for one year or less may be granted to entrymen who have established actual residence on the lands entered by them in all cases where total or partial failure or destruction of crops, sickness, or other unavoidable casualty has prevented the entryman from supporting himself and those dependent upon him by a cultivation of the land.

Applications for leaves of absence should be addressed to the register and receiver of the land office where the entry was made and should be sworn to by the applicant and some other disinterested person before such register and receiver or before some officer in the land district using a seal and authorized to administer oaths, except in cases where, through age, sickness, or extreme poverty, the entryman is unable to visit the district for that purpose, when the oath may be made outside of the land district. All applications of this kind should clearly set forth:

(a) The number and date of the entry, a description of the lands entered, the date of the establishment of his residence on the land, and the extent and character of the improvements and cultivation made by the applicant.

(b) The kind of crops which failed or were destroyed and the cause and extent of such failure or destruction.

(c) The kind and extent of the sickness, disease, or injury assigned, and the extent to which the entryman was prevente from continuing his residence upon the land, and, if practicable, a certificate signed by a reliable physician as to such sickness, disease, or injury, should be furnished.

(d) The character, cause, and extent of any unavoidable casualty which may be made the basis of the application.

(e) The dates from which and to which the leave of absence is requested.

Commutation of Homestead Entries.

37. All original, second, and additional homestead, and adjoining farm entries may be commuted, except such entries as are made under particular laws which forbid their commutation.

Where there has been immediately prior to the application to submit proof on a homestead entry at least fourteen months' actual and substantial continuous residence, accompanied by improvement and cultivation, the entryman, or his widow, heirs, or devisees, may obtain patent by proving such residence, improvement, and cultivation, and paying the cost of such proof, the land office fees, and the price of the land, which is $1.25 per acre outside the limits of railroad grants, and $2.50 per acre for lands within the granted limits, except as to certain lands which were opened under statutes requiring payment of a price different from that here mentioned. See circular of October 18, 1907 (Appendix No. 14).

Commutation proof can not be made on homestead entries allowed under the act of April 28, 1904 (33 Stat., 547), known as the Kinkaid act; entries under the Reclamation Act of June 17, 1902 (32 Stat., 388); entries under the enlarged homestead act (post par. 46 et seq.); entries allowed for coal lands under the act of June 22, 1910 (36 Stat., 583), so long as the land is withdrawn or classified as coal; additional entries allowed under the act of April 28, 1904 (33 Stat., 527, Appendix No. 4); second entries allowed under the act of June 5, 1900 (31 Stat. 267, Appendix No. 5); or second entries allowed under the act of May 22, 1902 (32 Stat., Appendix No. 5), when the former entry was commuted.

Homestead Final and Commutation Proof.

38. Either final or commutation proof may be made at any time when it can be shown that residence and cultivation have been maintained in good faith for the required length of time, but if final proof is not made within seven years from the date of a homestead entry the entry will be canceled unless some good excuse for the failure to make the proof within the seven years is given with satisfactory final proof as to the required residence and cultivation made after the expiration of the seven years.

39. By Whom Proof May Be Offered.—Final proof must be made by the entrymen themselves, or by their widows, heirs, or devisees, and can not be made by their agents, attorneys in fact, administrators, or executors, except in the cases hereinafter mentioned. In order to submit final five-year proof the entryman, his widow, or the heir or devisee submitting proof must be a citizen of the United States. As a general rule commutation proof may be submitted by one who has declared his or her intention to become a citizen, but on entries made for land in certain reservations opened under special acts the person submitting commutation proof must be a citizen of the United States.

(a) If an entryman becomes insane after making his entry and establishing residence, patent will issue to the entryman on proof by his guardian or legal representative that the entryman had complied with the law up to the time his insanity began. In such a case if the entryman is an alien and has not been fully naturalized evidence of his declaration of intention to become a citizen is sufficient.

(b) If a person has made a homestead entry and afterwards died while he was serving as a soldier or a sailor during the Spanish-American war or the Philippine insurrection, patent will issue upon proof made by his widow, if unmarried, or in case of her death or marriage then his minor orphan children, or his, her, or their legal representatives.

(c) Where entries have been made for minor orphan children of soldiers or sailors, proof may be offered by their guardian, if any, if the children are still minors at the time the proof should be made.

(d) When an entryman has abandoned the land covered by his entry and de-

serted his wife, she may make final or commutation proof as his agent, or, if his wife be dead and the entryman has deserted his minor children, they may make the same proof as his agent, and patent will issue in the name of the entryman.

(e) When an entryman dies leaving children, all of whom are minors, and both parents are dead, the executor or administrator of the entryman, or the guardian of the children, may at any time within two years after the death of the surviving parent, sell the land for the benefit of the children by proper proceedings in the proper local court, and patent will issue to the purchaser; but if the land is not sold patent will issue to the minors upon proof of death, heirship, and minority being made by such administrator or guardian.

40. How Proofs May Be Made.—Final or commutation proofs may be made before any of the officers mentioned in paragraph 16, as being authorized to administer oaths to applicants.

Any person desiring to make homestead proof should first forward a written notice of his desire to the register and receiver of the land office, giving his post-office address, the number of his entry, the name and official title of the officer before whom he desires to make proof, the place at which the proof is to be made, and the name and post-office addresses of at least four of his neighbors who can testify from their own knowledge as to facts which will show that he has in good faith complied with all the requirements of the law.

41. Publication Fees.—Applicants shall hereafter be required to make their own contracts for publishing notice of intention to make proof, and they shall make payment therefor directly to the publishers, the newspaper being designated and the notice prepared by the register.

42. Duty of Officers Before Whom Proofs Are Made.—On receipt of the notice mentioned in the preceding paragraph, the register will issue a notice naming the time, place, and officer before whom the proof is to be made and cause the same to be published once a week for five successive weeks in a newspaper of established character and general circulation published nearest the land, and also post a copy of the notice in a conspicuous place in his office.

On the day named in the notice the entryman must appear before the officer designated to take proof with at least two of the witnesses named in the notice; but if for any reason the entryman and his witnesses are unable to appear on the date named, the officer should continue the case from day to day until the expiration of ten days, and the proof may be taken on any day within that time when the entryman and his witnesses appear, but they should, if it is at all possible to do so, appear on the day mentioned in the notice. Entrymen are advised that they should, whenever it is possible to do so, offer their proofs before the register or receiver, as it may be found necessary to refer all proofs made before other officers to a special agent for investigation and report before patent can issue, while, if the proofs are made before the register and receiver, there is less liklihood of this being done, and there is less probability of the proofs being incorrectly taken. By making proof before the register or receiver the entryman will also save the fees which they are required to pay other officers, as they will be required under the law to pay the register and receiver the same amount of fees in each case, regardless of the fact that the proof may have been taken before some other officer.

Entrymen are cautioned against improvidently and improperly commuting their entries, and are warned that any false statement made in either their commutation or final proof may result in their indictment and punishment for the crime of perjury.

43. Fees and Commissions.—When a homesteader applies to make entry he must pay in cash to the receiver a fee of $5 if his entry is for 80 acres or less, or $10 if he enters more than 80 acres. And in addition to this fee he must pay, both at the time he makes entry and final proof, a commission of $1 for each 40 acre tract entered outside of the limits of a railroad grant and $2 for each 40-acre tract entered within such limits. Fees under the enlarged homestead act are the same as above, but the commissions are based upon the area of the land embraced in the entry (see par. 48). On all final proofs made before either the register or receiver, or before any other officer authorized to take proofs, the register and receiver are entitled to receive 15 cents for each 100 words reduced to writing, and no proof can be accepted or approved until all fees have been paid.

In all cases where lands are entered under the homestead laws in Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming, the commission due to the register and receiver on entries and final proofs, and the testimony fees under final proofs, are 50 per cent more than those above specified, but the entry fee of $5 or $10, as the case may be, remains the same in all the States.

United States commissioners, United States court commissioners, judges, and clerks are not entitled to receive a greater sum than 25 cents for each oath admin-

istered by them, except that they are entitled to receive $1 for administreing the oath to each entryman and each final proof witness to final proof testimony, which has been reduced to writing by them.

44. The alienation of all or any part of the land embraced in a homestead prior to making proof, except for the public purposes mentioned in section 2288, Revised Statutes (see Appendix No. 1), will prevent the entryman from making satisfactory proof, since he is required to swear that he has not alienated any part of the land except for the purposes mentioned in section 2288, Revised Statutes.

A mortgage by the entryman prior to final proof for the purpose of securing money for improvements, or for any other purpose not inconsistent with good faith, is not considered such an alienation of the land as will prevent him from submitting satisfactory proof. In such a case, however, should the entry be canceled for any reason prior to patent, the mortgagee would have no claim on the land or against the United States for the money loaned.

Alienation After Proof and Before Patent.—The right of a homestead entryman to patent is not defeated by the alienation of all or a part of the land embraced in his entry after the submission of final proof and, prior to patent, provided the proof submitted is satisfactory. Such an alienation is, however, at the risk of the entryman, for if the reviewing officers of the land department subsequently find the final proof so unsatisfactory that it must be wholly rejected and new proof required, the entryman can not then truthfully make the nonalienation affidavit required by section 2291, Revised Statutes, and his entry must in consequence be canceled. The purchaser takes no better title than the entryman had, and if the entry is canceled purchaser's title must necessarily fail.

45. Relinquishments.—A homestead entryman, or in case of his death, his statutory successor, as explained in paragraph 22, may file a written relinquishment of his entry, and on the filing of such relinquishment in the local land office the land formerly covered by the entry becomes at once subject to entry by the first qualified applicant.

Relinquishments run to the United States alone, and no person obtains any right to the land by the mere purchase of a relinquishment of a filing or entry.

Entries made for the purpose of holding the land for speculation and sale of the relinquishments are illegal and fraudulent. Every effort will be made to prevent such frauds and to detect and punish the perpetrators.

Purchasers of relinquishments of fraudulent filings or entries should understand that they purchase at their own risk so far as the United States is concerned, and they must seek their own remedies under local laws against those who by imposing such relinquishments upon them have obtained their money without valuable consideration.

Enlarged Homestead Entries.

46. Kind of Land Subject to Entry.—The first section of the act of February 19, 1909 (35 Stat., 639; see Appendix No. 15), provides for the making of homestead entries for an area of 320 acres, or less, of nonmineral, nontimbered, nonirrigable public land in the States of Colorado, Montana, Nevada, Oregon, Utah, Washington, Wyoming, and in the Territories of Arizona and New Mexico. By the first section of the act approved June 17, 1910 (36 Stat., 531; see Appendix No. 15), the same kind of entries are allowed to be made in the State of Idaho.

The terms "arid" or "nonirrigable" land, as used in these acts, are construed to mean land which, as a rule, lacks sufficient rainfall to produce agricultural crops without the necessity of resorting to unusual methods of cultivation, such as the system commonly known as "dry farming," and for which there is no known source of water supply from which such land may be successfully irrigated at a reasonable cost.

Therefore lands containing merchantable timber, mineral lands, and lands within a reclamation project, or lands which may be irrigated at a reasonable cost from any known source of water supply, may not be entered under these acts. Minor portions of a legal subdivision susceptible of irrigation from natural sources, as, for instance, a spring, will not exclude such subdivision from entry under these acts, provided, however, that no one entry shall embrace in the aggregate more than 40 acres of such irrigable lands.

47. Designation of Lands.—From time to time lists designating the lands which are subject to entry under these acts are sent to the registers and receivers in the States affected, and they are instructed immediately upon the receipt of such lists to note the same upon their tract books. Until such lists have been received by them no applications to enter can be received and no entries allowed under these acts, but after the receipt of such lists it is competent for them to dispose of applications

for land embraced therein under the provisions of these acts, in like manner as other applications for public lands.

The fact that lands have been designated as subject to entry is not conclusive as to the character of such lands, and should it afterwards develop that the land is not of the character contemplated by the above acts the designation may be canceled; but where an entry is made in good faith under the provisions of these acts, such designation will not thereafter be modified to the injury of anyone who, in good faith, has acted upon such designation. Each entryman must furnish affidavit as required by section 2 of the acts.

48. Compactness—Fees.—Lands entered under the enlarged homestead acts must be in a reasonably compact form and in no event exceed 1½ miles in length.

The acts provide that the fees shall be the same as those now required to be paid under the homestead laws; therefore, while the fees may not in any one case exceed the maximum fee of $10 required under the general homestead law, the commissions will be determined by the area of the land embraced in the entry.

49. Form of Application.—Applications to make entry under these acts must be submitted on forms prescribed by the General Land Office, and in case of an original entry on No. 4-003.

The affidavit of an applicant as to the character of the land must be corroborated by two witnesses. It is not necessary that such witnesses be acquainted with the applicant, and if they are not so acquainted their affidavits should be modified accordingly.

50. Additional Entries.—Sections 3 of the acts provide that any homestead entrymen of lands of the character described in the first sections of the act, upon which entry final proof has not been made, may enter such other lands subject to the provisions of the acts, contiguous to the former entry, which shall not, together with the lands embraced in the original entry, exceed 320 acres, and that residence upon and cultivation of the original entry shall be accepted as equivalent to residence upon and cultivation of the additional entry.

These sections contemplate that lands may, subsequent to entry, be classified, or designated, by the Secretary of the Interior as falling within the provisions of these acts, and in such cases an entryman of such lands may, at any time prior to final proof on his original entry, make such additional entry, provided he is otherwise qualified. Applicants for such additional entries must tender the proper fees and commissions, and make application and affidavit on the form prescribed (No. 4-004). Entrymen who have made final proof on their original entries, are not qualified to make additional entries.

51. Final Proof on Original and Additional Entries—Commutation Not Allowed. —Final proof must be made as in ordinary homestead cases, and in addition to the showing required of ordinary homestead entrymen it must be shown that at least one-eighth of the area embraced in each entry has been continuously cultivated to agricultural crops other than native grasses, beginning with the second year of the entry, and that at least one-fourth of the area embraced in the entry has been continuously cultivated to agricultural crops other than native grasses, beginning with the third year of the entry and continuing to date of final proof.

Final proof submitted on an additional entry must show that the area of such entry required by the acts to be cultivated has been cultivated in accordance with such requirement; or that such part of the original entry as will, with the area cultivated in the additional entry, aggregate the required proportion of the combined entries, has been cultivated in the manner required by the acts.

Proof must be made on the original entry within the statutory period of seven years from the date of entry; and if it can not be shown at that time that the cultivation has been such as to satisfy the requirements of the acts as to both entries it will be necessary to submit supplemental proof on the additional entry at the proper time. But proof should be made at the same time to cover both entries in all cases where the residence and cultivation are such as to meet the requirements of the acts.

Commutation of either original or additional entry, made under these acts, is expressly forbidden.

52. Right of Entry.—Homestead entries under the provisions of section 2289 of the Revised Statutes, for 160 acres or less, may be made by qualified persons within the States and Territories named upon lands subject to such entry, whether such lands have been designated under the provisions of these acts or not. But those who make entry under the provisions of these acts can not afterwards make homestead entry under the provisions of the general homestead law, nor can an entryman who enters under the general homestead law lands designating as falling within the provisions of these acts afterwards enter any lands under these acts.

A person who has since August 30, 1890, entered and acquired title to 320 acres of land under the agricultural land laws (which is construed to mean the timber and stone, desert land, and homestead laws), is not entitled to make entry under these acts; neither is a person who has acquired title to 160 acres under these acts, unless entitled to the benefits of section 2 of the act of June 5, 1900 (31 Stat., 267), or section 2 of the act of May 22, 1902 (32 Stat., 203, Appendix No. 5).

If, however, a person is a qualified entryman under the homestead laws of the United States, he may be allowed to enter 320 acres under these acts, or such a less amount as when added to the lands previously entered or held by him under the agricultural land laws shall not exceed in the aggregate 480 acres.

* * *

55. Officers Before Whom Applications and Proofs May Be Made.—The acts provide that any person applying to enter land under the provisions thereof shall make and subscribe before the proper officer an affidavit, etc. The term "proper officer," as used herein, is held to mean any officer authorized to take affidavits or proof in homestead cases.

FRED DENNETT, Commissioner.

Approved, September 24, 1910.

FRANK PIERCE, Acting Secretary.

The fees for making a homestead entry in Montana depend upon the quantity of land entered and whether it is within or outside the 40-mile limit of the grant to the Northern Pacific Railway Company.

For an enlarged homestead of 320 acres outside the limit of the railroad grant the fees are $22 and within the limit of the grant $34. For the homestead of 160 acres outside the limit of the railroad grant the fees are $16 and within the limits of the grant $22.

A Scene on Rock Creek, Granite County.

CROPS IN 1911.

The preliminary estimates of the crops of 1911 referred to on page 87 have been modified by the revised estimates which the Department of Agriculture issued January 5, 1912. The later estimates, which use as a basis the census figures for acreage in 1909, increase the estimated yield of oats in Montana and decrease the estimated yield of wheat. For spring wheat the acreage is estimated as 200,000, the average yield per acre 25.2 bushels, the total production 5,040,000 bushels of a value at the farm, December 1, 1911, of $3,881,000; for winter wheat the acreage is estimated as 229,000, the average yield per acre 31.7 bushels, and the total production 7,259,000 bushels having a value of $5,589,000. For all wheat the estimates are: Acreage 429,000; average yield per acre 28.7 bushels; production 12,229,000 bushels; value, $9,470,000. The final figures of the acreage and production of wheat that will appear in the Year Book will be looked for with interest as the acreage and production are believed to be far greater than the revised estimates give. Put in the form of a table the estimtaes on the leading crops are as follows:

Montana Crop Statistics for 1911.

Crop.	Acreage.	Yield per Acre.	Products in in Bushels.	Value.
Wheat	429,000	28.7	12,299,000	$ 9,740,000
Oats	425,000	49.8	21,165,000	$ 8,466,000
Barley	31,000	34.5	1,070,000	$ 728,000
Rye	8,000	23.0	184,000	$ 132,000
Corn	20,000	26.5	530,000	$ 424,000
Flaxseed ...	425,000	7.7	3,272,000	$ 5,890,000
Potatoes ...	27,000	150.0	4,050,000	$ 2,977,000
Hay	612,000	(Tons) 2.00	(Tons) 1,224,000	$12,240,000
	1,977,000			$40,597,000

The average yield per acre of wheat in the United States was, 12.5 bushels, of oats 24.4 bushels, of barley 21 bushels, of rye 15.6 bushels, of corn 23.9 bushels, of flaxseed 7.0 bushels, of potatoes 80.9 bushels, and of hay 1,10 tons.

Attend the Montana State Fair at Helena, September 23-28, 1912. Visit the Permanent Exhibit of the Montana State Fair, Kohrs Block, Helena, which is open the year around.

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